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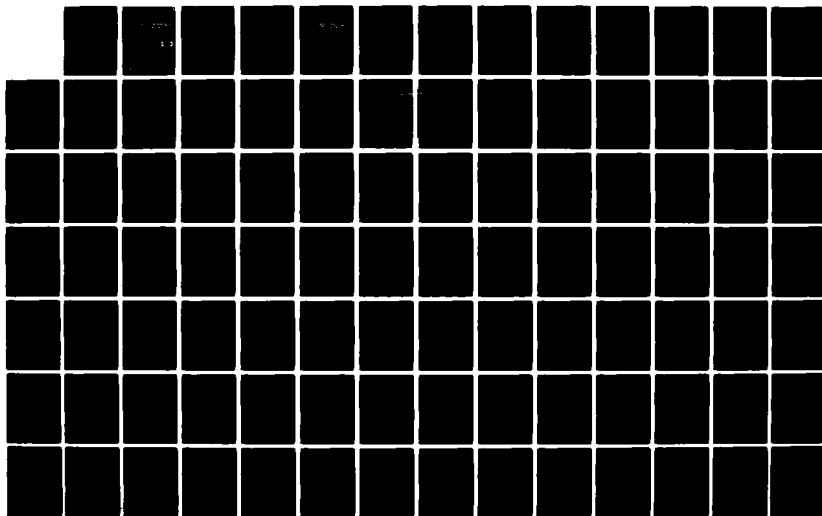
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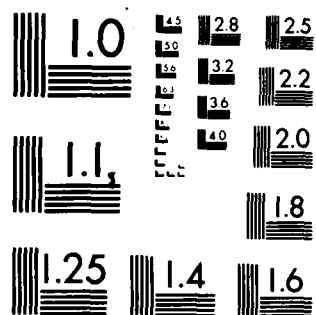
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**RECOMMENDED SYSTEM DESIGN FOR THE  
OCCUPATIONAL HEALTH MANAGEMENT  
INFORMATION SYSTEM (OHMIS)**

ADA 128870

Volume 1

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JUN 2 1983  
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Prepared for:  
U.S. Department of the Army  
Office of the Surgeon General  
Health Services Command

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Under Contract No. MDA-903-81-C-0515

April 1983

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| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number)<br>The report provides a recommended system design for a Department of Army Occupational Health Management Information System (OHMIS). The system design includes: detailed function data flows for each of the core data processing functions of OHMIS, in the form of input/processing/output algorithms; detailed descriptions of the inputs and outputs; performance specifications of OHMIS; resources required to develop and operate OHMIS (Vol II). |                                   |  |

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In addition, the report provides a summary of the rationale used to develop the recommended system design, a description of the methodology used to develop the recommended system design, and a review of existing commercial systems using a specified set of evaluation criteria.

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**RECOMMENDED SYSTEM DESIGN FOR THE  
OCCUPATIONAL HEALTH MANAGEMENT  
INFORMATION SYSTEM (OHMIS)**

Volume 1

Prepared for:  
U.S. Department of the Army  
Office of the Surgeon General  
Health Services Command

Under Contract No. MDA-903-81-C-0515

April 1983

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# FOREWARD

This is Volume 1 of a two volume report for the U. S. Army entitled, "Recommended System Design for the Occupational Health Management Information System (OHMIS)." The report was prepared by SAFETY SCIENCES under Contract No. MDA-903-81-C-0515 to the U. S. Army Office of the Surgeon General, Health Services Command

Volume 1 consists of the Executive Summary and Sections I through VII of the report as shown on the Table of Contents that follows. Volume 2 consists of Section VIII, the References and Appendices.

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EXECUTIVE SUMMARY

## EXECUTIVE SUMMARY

This document is the final report of Contract MDA-903-81-C-0615, "Develop a Recommended System Design for an Occupational Health Management Information System," sponsored by the U. S. Department of the Army (DA), Office of the Surgeon General, Health Services Command. This report provides:

- o A recommended system design for the Department of the Army's Occupational Health Management Information System (hereafter referred to as OHMIS). The system design includes:
  - Detailed Functional Data Flows for each of the core data processing functions of OHMIS. These are in the form of Input/Processing/Output algorithms (IPOs) and are in sufficient detail to enable the core computer programs that make up OHMIS to be developed directly from the Functional Data Flows.
  - Detailed descriptions of the inputs and outputs of the OHMIS core data processing functions.
  - Descriptions of the performance specifications of OHMIS.
  - An overview of the resources required to develop and operate OHMIS and the expected impact of OHMIS. (Given in Volume II.)
- o A summary of the rationale for the recommended system design for OHMIS.
- o A description of the methodology used to develop the recommended system design for OHMIS, including:
  - The methods used to identify the DA informational needs that should be served by OHMIS. The major methods used were:
    - 1) a review of the occupational safety and health and automated data management regulatory requirements to identify those requirements that should be met by OHMIS; and,
    - 2) interviews with all of the potential users of OHMIS to establish their informational needs. The interviews included visits to five DA installations to examine local installation informational needs.

The informational needs were summarized in the forms of "use modules" listing, for each major user of OHMIS, the ways in which the user could be expected to use

OHMIS to perform his/her occupational health program functions. These use modules form the basis of the recommended system design for OHMIS.

- The methods used to evaluate the two major options for developing a recommended system design for OHMIS and select one of the options. The two options were:
  - 1) select an existing occupational health information system and adapt it for use as OHMIS; or
  - 2) develop a new system for OHMIS.

A review of the existing commercial systems using a specified set of evaluation criteria was made. These systems were compared with each other and a hypothetical new information system to determine which of the two options would yield the best system for the Department of the Army. The conclusion reached was that the development of a new system was the best option. This conclusion was reached primarily because: 1) the development of a new system means that the system can be designed specifically to meet the Department of the Army's informational needs; and 2) the projected costs for developing a new system were under the budgeted amount for the development of OHMIS.

#### SUMMARY OF THE RECOMMENDED SYSTEM DESIGN FOR OHMIS

A summary of the features and the two primary data processing functions of the recommended system design for OHMIS is given below.

#### Features of the OHMIS Recommended System Design

The recommended system design for OHMIS described in this report has the following major features:

- o The costs of OHMIS are within the constraints of the Class IV system, i.e., less than \$3 million.
- o OHMIS will use five major types of data. These are:
  1. Data on the characteristics of the DA employees (both military and civilian) covered by OHMIS;
  2. Data on the characteristics of the workplaces (facilities and sites) covered by OHMIS;
  3. Data on the hazards to which DA employees are exposed;

4. Data on medical events, i.e., information on the injuries and illnesses incurred by DA employees and the medical services received to prevent or treat the injuries/illnesses; and
  5. Data on the preventive/corrective actions addressing the hazards to which DA employees are exposed or ameliorating the injuries/illnesses incurred as a result of exposure to these hazards. This type of data includes requirements description data, i.e., data on the policies and procedures that the DA prescribes for the operation of its occupational health program. A major source for such preventive/corrective actions and requirements data is occupational safety and health regulations.
- o To the greatest extent possible, OHMIS will use the existing DA data sources for the above five types of data. Significant portions of the largest types of data used in OHMIS are already available in computerized form on DA data bases developed for other purposes. In particular, the majority of the first two types of data used in OHMIS (employee and workplace characteristics) is available on the DA's existing personnel and facilities information systems. A significant source for the third type of data (hazards data) is the DA supplied information systems; and, some of the fourth type of data (medical events data), particularly for inpatient medical services, is available on computerized DA data bases. These data sources, developed by DA agencies other than the Occupational Health Program activity, are referred to as "external data sources." To make the system economical, OHMIS will not regenerate the data in these external data sources. Instead, copies will be routinely made of the data elements relevant to OHMIS that are on the existing data bases of the external sources. Supplements to these data sources will be made through input of data unique to OHMIS. Only the fifth data type (preventive/corrective actions and requirements description data) will be almost entirely generated by the operation of OHMIS. Throughout the design of OHMIS, the distinction is made between data generated from external data sources and data generated solely by OHMIS. Almost all OHMIS generated data is expected to be entered onto the OHMIS data base through data entry forms developed specifically for OHMIS. The description of the core data processing functions of the recommended system design for OHMIS is confined to OHMIS generated data.
- o OHMIS is expected to use VIABLE as the host hardware for the system. VIABLE is a hardware and executive software environment currently in the installation phase in 47 DA bases. It will be the primary base-operated information systems' capability for most DA installations. As a

possible host for OHMIS, such a network seems ideal, because:

- The easily expanded on-line storage capacities are well suited for a system of the size of OHMIS;
  - Using VIABLE as a host significantly lessens the hardware procurement burden (costs and delays in implementation) which would otherwise be necessary;
  - Many of the external DA data sources with which OHMIS must interface will also use VIABLE as their host environment; therefore, interface with these external data sources.
- o OHMIS is designed to allow interactive, on-line entry of OHMIS generated data and interactive, on-line query of all OHMIS data. One of the most frequent complaints about current DA occupational health data expressed by the potential users of OHMIS is that the data is not readily available to them. Another problem noted is the very poor quality control of existing DA data bases that do not allow for interactive entry and editing. The interactive feature of OHMIS is designed to address these problems. A Data Base Management System (DBMS) approach will be used in the design of the query system for OHMIS. The majority of the outputs of OHMIS will be generated using this DBMS query system. This means that the outputs of OHMIS will vary according to the individual users' changing needs. For this reason, only the information system management outputs and the outputs automatically generated by OHMIS as a part of its core data processing functions are described in the recommended system design given in this report.
- o OHMIS has been designed to be highly flexible and readily adaptable to change. The reason for this feature is that it is expected that:
- The informational needs of the Department of the Army's occupational health program will change over time;
  - There will be significant and frequent changes in the requirements, including regulations, under which the DA occupational health program will operate;
  - The external data sources on which OHMIS depends for a large supply of its data may change;
  - Agencies external to the DA, such as the TRIMIS (Tri-Service Medical Information Systems) project, which prescribe specifications for the medical information systems of the Department of Defense (DoD), will continue to prescribe information systems specifica-

tions affecting OHMIS and resulting in the need to change OHMIS to comply with these specifications; and,

- There will be considerable variation between local installations in the needs for and uses of OHMIS.

Some of the features of the recommended system design for OHMIS that make it readily adaptable to change are:

- All OHMIS generated data may be entered using one common data entry program, namely, a program for entering data from specially designed data entry sheets (referred to generically as OHMIS forms);
  - Users may develop new OHMIS forms at any time without additional programming and without changing or degrading the current OHMIS data base;
  - A generic method for entering and processing the requirements data that will initiate the operation of OHMIS and prescribe the management functions performed by OHMIS has been developed. This generic method allows frequent and extensive changes to these requirements without affecting the current OHMIS data base or requiring changes in the OHMIS computer programs.
- o OHMIS is designed to automatically perform the two primary data processing functions of any occupational health program, namely:
- The requirements triggering function. OHMIS allows the user to specify requirements and preventive/corrective actions for the operation of the DA occupational health program. OHMIS then uses these specifications to routinely and "automatically" identify the occasions or circumstances in which these requirements apply, i.e., to "trigger" the execution of the required actions.
  - The requirements monitoring function. OHMIS is designed to routinely audit the DA occupational health program activities in order to monitor the status of all applicable required actions (and all data entry forms associated with executing these actions) until these actions and forms are completed.

During the review of DA occupational health informational needs made during the development of OHMIS, it was found that the most significant need is for an information system that will assure that all applicable policies and requirements for the DA occupational health program are continually identified, triggered and monitored with a high degree of accuracy, consistency and comprehensiveness. These functions are currently being performed manually by DA



occupational health program managers and personnel to a large degree. The implementation of OHMIS will assure that the triggering and monitoring of occupational health program requirements is performed more systematically and consistently and that changes in the occupational health program requirements are readily reflected in the operation of the DA occupational health program.

The institution of the OHMIS requirements triggering and monitoring capabilities will mean that the Department of the Army's occupational health program will be considerably more powerful and useful than other programs using existing occupational health information systems. The current conventional occupational health information systems do little more than store and retrieve requirements data or, at most, identify abnormal readings. The potential for using the occupational health information system to actually perform the management functions of requirements triggering and monitoring has not been previously recognized. The use of an occupational health information system in this way is a newly conceived feature that will make the Army's OHMIS system unique.

#### Two Primary Data Processing Functions of OHMIS

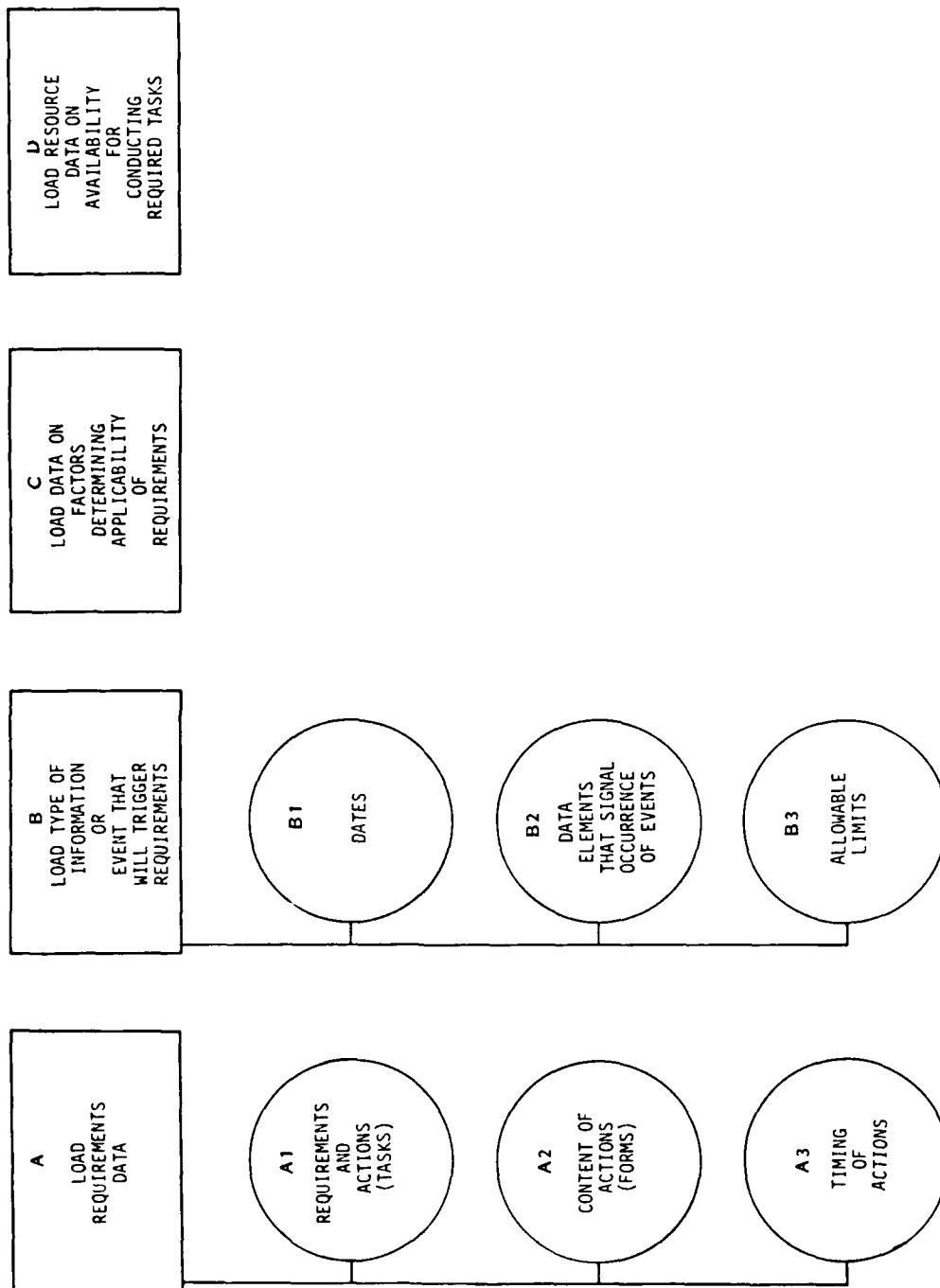
FIGURES 1 and 2 show how the two primary data processing functions of an occupational health program (i.e., requirements for triggering and monitoring) are performed by OHMIS as it is designed in the recommended system description given in this report. FIGURE 1 provides a description of the types of data needed to start OHMIS, i.e., data that must be preloaded before OHMIS becomes operational. The majority of the preloaded data is requirements type data. FIGURE 2 shows the data entered to operate OHMIS and the core data processing functions that are automatically initiated by the entry of any operational (i.e., not preloaded) data into the OHMIS data base. The operational data consists of all of the five major types of OHMIS data described above, except the requirements type of preventive/corrective actions data. FIGURE 2 also indicates the point in the OHMIS program at which the preloaded data is used to examine the operational data and perform the requirements triggering and monitoring functions, i.e., perform the management decision-making process involved in administering an occupational health program.

As can be seen in FIGURE 1, there are four types of preloaded data. The first three types are requirements description data; the fourth type is data on the personnel resources available for scheduling the required occupational health program actions. Some of these types of data must be entered onto the OHMIS data base prior to its initial operation; this preloaded data can be added to or changed at any time.

FIGURE 2 shows how each of the preloaded data types (Data Types A-D) identified in FIGURE 1 are used by OHMIS to automatically perform all of the required data processing functions needed for the two core program functions involved in the administration of the DA occupa-

FIGURE 1

**TO START OHMIS:**



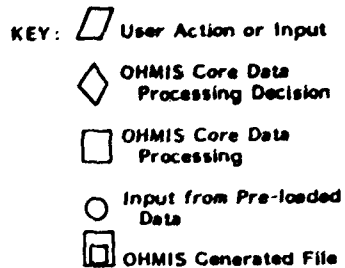
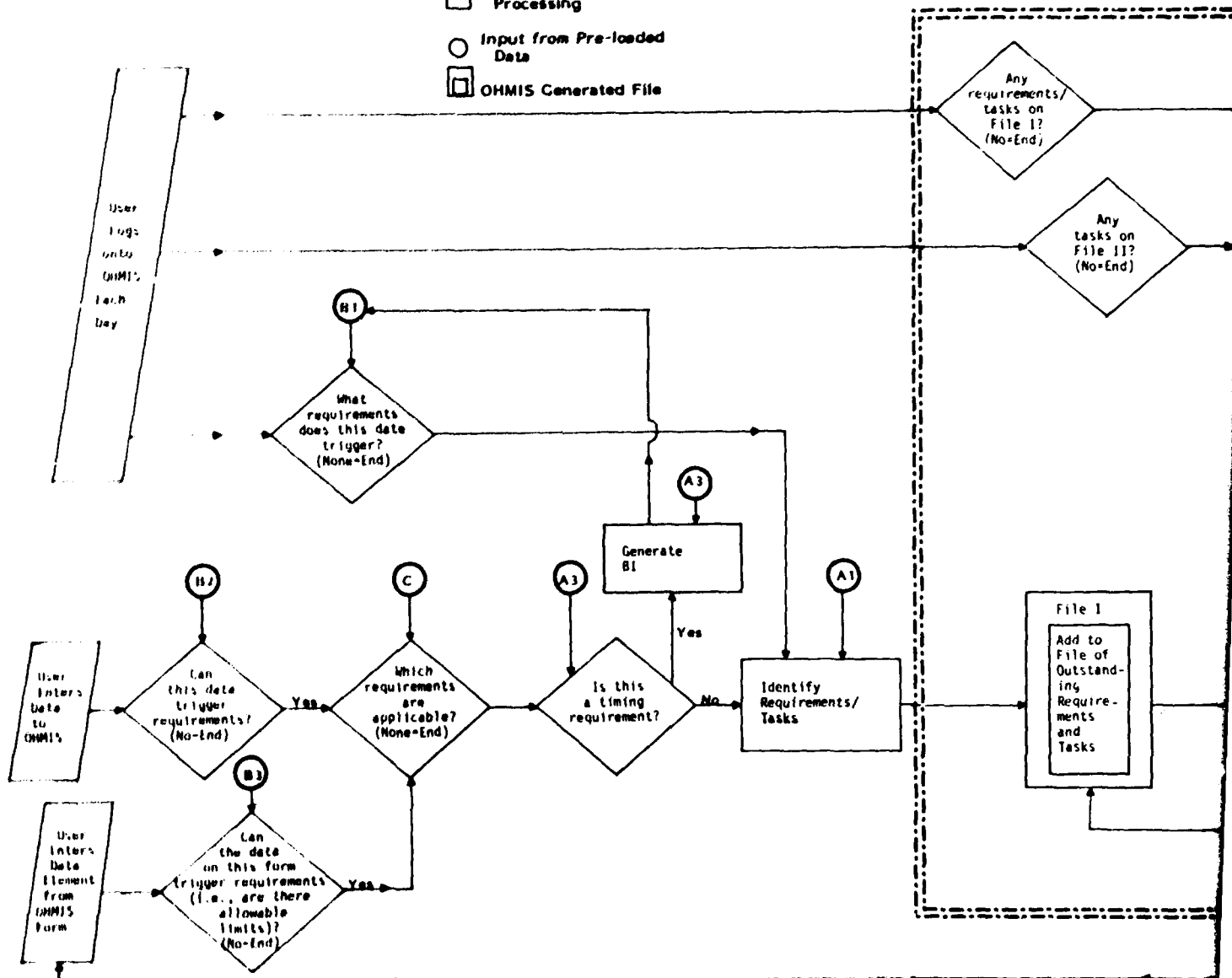
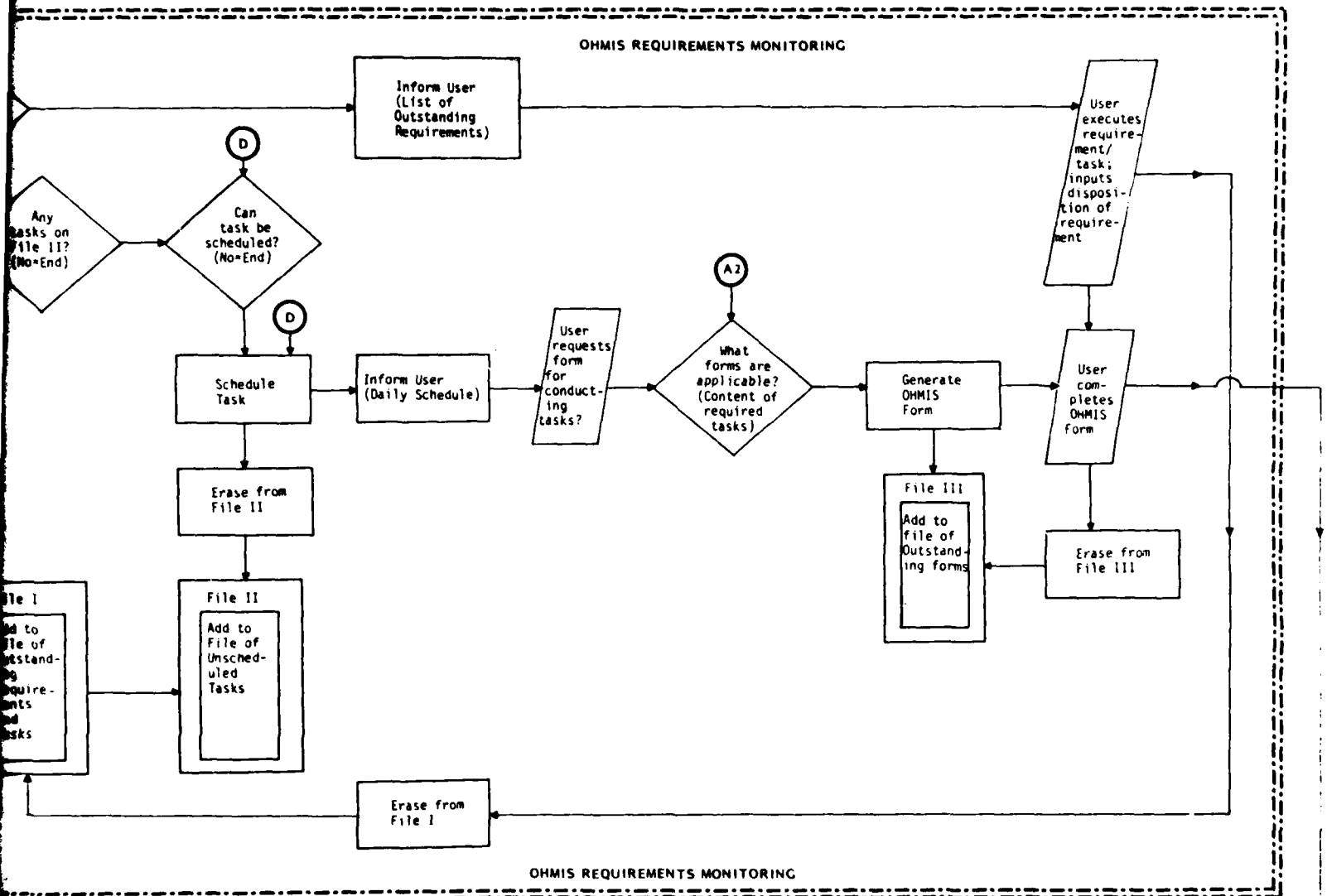


FIGURE 2

# TO OPERATE OHMIS



# OHMIS:



tional health program, namely, the triggering and monitoring of requirements. Specifically, FIGURE 2 shows that each time there is input to OHMIS, either in the form of: 1) "logging onto" the OHMIS system, 2) entering data from an external data source, or 3) entering data from an OHMIS form (shown by the three parallelograms on the right side of FIGURE 1), OHMIS will automatically:

1. Execute the requirements triggering function, i.e.,:
  - Decide whether the input of the user indicates that there may be some potentially applicable requirements.
  - Decide what requirements should be triggered, i.e., which of the potentially applicable requirements apply.
2. Execute the requirements monitoring function (shown in the dotted box), i.e.,:
  - Schedule the tasks (required actions) specified by the requirements determined to be applicable.
  - Generate the OHMIS forms needed to conduct the required tasks in accordance with the content specifications of the applicable requirements, i.e., in accordance with the specifications for the exact tests and measurements required to perform the required tasks.
  - Monitor and provide status reports on all outstanding tasks and forms until they are completed.
3. Provide a means for entering data from the forms completed during the execution of the required tasks. The entry of OHMIS forms data onto the OHMIS data base sets in motion a repeat of the above two data processing functions. That is, the OHMIS program determines whether the data from an OHMIS form should trigger additional requirements; if so, which requirements; etc.

Both of these primary functions can be performed at all management levels ranging from the individual local installation to the DA or Command level. For example, in the monitoring of the status of DA occupational health program requirements, the OHMIS program will allow the DA to determine the status of the implementation of any particular type of requirement (or all requirements) at any given installation or command or all installations/commands.

#### REMAINING PRE-IMPLEMENTATION TASKS

The exact data processing algorithms through which the primary data processing functions are performed are given in the eleven core Functional Data Flows shown in Section 6.8 of this report. These data flows are in sufficient detail to enable the corresponding computer programs to be developed. Thus, three major tasks remain before the process of implementing OHMIS can begin:

1. Development of the OHMIS computer programs based on the Functional Data Flows provided in this report. The Functional Data Flows give the Inputs/Processing/Outputs (I/P/Os) algorithms for the eleven core computer programs needed to perform all of the primary data processing functions of OHMIS. Although additional programs may be desired at a later date, no additional programming is required to operate OHMIS.
2. Development of the initial set of requirements data and resource availability data that is to be preloaded into the OHMIS data base. It is recommended that this be done in the format of a DA occupational health program and information system procedural manual. The review of DA occupational health program documents made as a part of this study revealed that much of the information required to preload OHMIS is already available in written form. However, there are significant gaps in the occupational health program requirements and specifications, at present. Some of these gaps will need to be rectified prior to completing the initial procedural manual for OHMIS.

In most cases, the content specifications of the occupational health program requirements entered into the OHMIS data base (e.g., the exact tests or measurements that should be included in a given type of required medical examination or a given type of Industrial Hygiene survey) are entered onto the OHMIS data base by specifying the contents of an OHMIS data entry form (i.e., by specifying the data elements that are to be collected and entered onto the form). This means that to a large degree, the procedural manual will consist of a series of OHMIS forms. Because the OHMIS core data processing programs use one standard data entry program for any OHMIS form, it will not be necessary to complete the initial set of OHMIS forms before the development of the OHMIS computer programs can be started.

3. Finalization of the procedures for interfacing with the DA external data sources and using the VIABLE system as the host for OHMIS. The feasibility of doing both of these tasks was thoroughly evaluated during this project and found to be very high. However, specific procedures are needed.

The completion of these three tasks will enable the implementation of OHMIS to begin. With the institution of OHMIS, the Department of the Army will have a state-of-the-art management tool needed to support the decision-making processes involved in the systematic and comprehensive operation of the DA occupational health program.

SECTION I - BACKGROUND AND METHODOLOGY

## I. BACKGROUND AND METHODOLOGY

This document is the final report of Contract MDA-903-81-C-0515, "Develop a Recommended System Description for an Occupational Health Management Information System." It provides a recommended system design of an Occupational Health Management Information System (hereafter referred to as 'OHMIS') developed for the Department of the Army (DA) under the above contract. It also provides a description of the methodology and rationale used to develop this recommended system design for OHMIS.

The remaining parts of Section I of this report describe the background and methodology used to develop the OHMIS recommended system design. Section II provides a review of the features and capabilities needed in a DA OHMIS system. This assessment of needs is based on a review of the regulations affecting occupational health programs and the development of information systems and interviews with the potential users of the DA OHMIS system. Section III categorizes the users of OHMIS into four major groups. This Section also summarizes the needs identified in Section II in terms of how each of the major users of OHMIS would use this information system to accomplish their various occupational health program objectives. These potential uses of OHMIS form the basis of the recommended system design for OHMIS given in this report. Section IV explores two basic options for developing an OHMIS for the Department of the Army, namely: 1) using an existing commercially available system; and 2) developing a new system. The rationale for choosing the latter option is also given in Section IV. Sections V through VIII provide the recommended system design for OHMIS. Part I of this recommended system design (Section V) provides a summary of the recommended system. Part II (Section VI) provides the detailed program logic (referred to as Functional Data Flows) for each of the 11 core data processing functions of the recommended OHMIS. Part III (Section VII) provides a brief description of some of the major system specifications of the recommended system. Part 4 (Section VIII) reviews the resources and impact of the development and operation of OHMIS as envisioned in the recommended system design.

### 1.1 BACKGROUND

As set forth in the Statement of Work at APPENDIX A, the requirements of Executive Order 12196, "Occupational Safety and Health Programs for Federal Employees," January 26, 1980, as implemented within the Department of Defense by Department of Defense Instruction (DODI) 6055.1, "Department of Defense Occupational Safety and Health Program," and within the U. S. Army, in part, by Army Regulation (AR) 40-5, "Health and Environment," has resulted in a rapidly expanding requirement to collect, analyze and store occupational health data. Complicating this growth is the requirement to correlate and analyze the interactions between individuals and their work environment and to store and retrieve the results of these analyses for as long as 25 years. Clearly these increased data handling requirements are beyond the capabilities of a manual information system except at the smallest Army



installations. Further, the need to centrally manage the total Army system, involving some 700 million bytes of data, virtually dictates the need for automation. Accordingly, Contract MDA-903-81-C-0515 was awarded (APPENDIX A) to examine Army requirements and existing systems and to prepare a plan for integrating the various requirements into a cogent whole. The result of this effort is the recommended system design for the Army OHMIS contained in this report. OHMIS will establish a vehicle to permit individual Army commands and installations to operate decentralized occupational health programs, while maintaining control of program criteria and oversight functions at the Health Services Command.

#### 1.1.1 Other Related Projects within the Department of the Army

This Section presents background information on the current or proposed projects within DA which will affect and which will be affected by the implementation of a comprehensive OHMIS.

- o VIABLE (Vertical Installation Automation Baseline). VIABLE is a hardware and executive software environment currently in the installation phase at 47 DA bases throughout the country. The well thought out hardware configuration establishes a network of distributed and centralized (regional or national) processing capabilities and the ability to support hundreds of local users in an on-line/interaction environment.

As a possible host for a proposed OHMIS, such a network seems ideal. The easily expanded on-line storage capacities are also very well suited for an information system of the projected size of the proposed OHMIS. An additional benefit to the OHMIS effort in using VIABLE as a host is the lessening of the hardware procurement burden which would otherwise be necessary. Perhaps the most significant advantage of VIABLE as a host for OHMIS is that many of the existing DA data bases (e.g., personnel systems such as SIDPERS, facility systems such as IFS, supply systems such as SAILS, etc., referred to throughout this report as external data sources) that must be integrated with OHMIS for OHMIS to operate economically will already be on VIABLE, thus making for easy "copying" of data from external data sources.

- o LOHHI and LOHHI II (Local Occupational Health Hazard Inventory). This system sets forth a catalogue of hazards which affect individual Army work places. The system, which is updated on an approximately three-year cycle, includes coded data elements for: Command, Subcommand, Installation, Building Number, Room Number, Exposed Workers by Name and Civilian/Military Breakout, Operation, Inventory Date, Hazards Present, Controls Required, and Status of Corrective Action. As presently designed, LOHHI is a batch processed system with no capability to sort and compare by individual

data elements. It is proposed to incorporate LOHHI information (expanded and reorganized) into the OHMIS with the goal of a data base that can be incrementally updated and a system of outputs that are useful at the local level.

- o HEARS (Hearing Evaluation Automated Registry System). This system, now being automated, is maintained by the U. S. Army Environmental Hygiene Agency (USAEHA) to monitor the effectiveness of the U. S. Army Hearing Conservation Program. DA military and civilian personnel who are routinely exposed to hazardous noise are required to receive baseline and periodic (at least annual) audiometric evaluations. Copies of the Reference Audiogram (DD Form 2215) and Hearing Conservation Data (DD Form 2216) are sent to USAEHA for entry into a computerized data registry via a key-to-disk process. DD Forms 2215 and 2216 have been evaluated and the proposed OHMIS will have the capability to include HEARS data without substantial change. An additional feature of the proposed OHMIS would be an interactive output process (through queries) that would allow the user to easily retrieve the base line data (Form 2215) on an individual, when preparing new periodic data (Form 2216). The data from HEARS will also be integrated into OHMIS so that OHMIS will automatically identify, trigger and monitor any required actions that should result from the entry of a particular value for a HEARS data element into the OHMIS data base (e.g., actions required to follow-up on the entry of a value identified as being abnormal).

#### 1.1.2 Other Related Projects Outside of the Department of the Army

In this Section, projects being conducted by agencies other than the Department of the Army that are related to OHMIS are briefly described.

- o MSDS (Material Safety Data Sheet). This is a DoD system that is operated by the Defense Logistics Agency and is intended to "provide technical information about the hazardous properties of items that in some manner affect DoD personnel by the unique aspects associated with the hazardous items." The system consists of a data base of the chemicals and related properties of hazardous substances; this data base is generated by entries made from Material Safety Data Sheets generated by individual Industrial Hygiene personnel throughout the DoD, who are actively participating in the system. The system suffers to a degree from duplication of effort because it is possible for more than one person to prepare and submit a Material Safety Data Sheet for the same hazardous substance. Because, at present, the policy of the DA on the use of the MSDS system has not yet been formalized, the recommended system design for OHMIS assumes only that OHMIS users may use the MSDS microfiche or hard copy outputs that describe the hazardous properties of stock listed and local purpose items. However, the OHMIS system has been designed to enable integration of OHMIS

generated hazardous substance data with the MSDS system's data, if desired. This will be done using the same procedures as the integration of OHMIS with other external data sources such as the DoD personnel systems, facility data systems, and supply systems. The feasibility of achieving this integration between the OHMIS and the MSDS data bases has been tentatively established as a part of the interviews conducted during the development of the OHMIS recommended system design.

- o TRIMIS (Tri-Service Medical Information Systems). TRIMIS is an ongoing project to develop guidelines and procedures, as well as specific systems, for all programs and information systems throughout the Department of Defense, affecting medical information. The purpose of this project is to avoid duplication in and easy integration of the great variety of information systems used in the provision of medical services by the DoD. As a part of developing the design for OHMIS, interviews were held with persons responsible for interacting with TRIMIS for the DA. Although no TRIMIS projects or systems currently exist that prescribe the characteristics of an occupational health information system, it was found that caution must be employed in the design of any new system to allow for integration with future procedures and systems developed under the auspices of TRIMIS. Accordingly, the recommended system design for OHMIS proposed in this report has features in it that make modifications to OHMIS easy to execute, so that OHMIS may be easily adapted to comply with any future data processing requirements of TRIMIS. For example, in the OHMIS recommended system design all data entry forms used in the system can be readily changed without any additional programming or changes in the OHMIS data base. Therefore, should TRIMIS at some point in the future, prescribe the content of a particular form of a type used in OHMIS (such as a form for recording information about the medical services, diagnoses and prognoses for outpatient clinic visits), the then current OHMIS form can readily be replaced by the TRIMIS prescribed form at that time. This important design feature of OHMIS makes it possible to progress with the development of OHMIS, rather than awaiting requirements that may be prescribed by TRIMIS in the future, but still keep the design of OHMIS in accordance with TRIMIS specifications.
- o UCA (Uniform Chart of Accounts). This is a system currently being developed on a DoD-wide basis to collect and analyze data on the medical services performed within DoD. The purpose of the system is to enable resource evaluation through the collection of data on the number of services of each type provided and on the resources (people and supplies) used to provide the services. Because UCA will eventually be used in all DA medical facilities, it was felt, at the beginning of the project that UCA may become

a potential host for the OHMIS system. Therefore, interviews were held with the developers of UCA. It was found that, because of the congressional mandate under which UCA is being developed, the possibility of using UCA hardware or facilities for OHMIS is at present precluded. Furthermore, unlike the VIABLE system described above, almost none of the data that will be on the UCA system will be of direct use to OHMIS. For these reasons, the idea of using UCA as a host for OHMIS was determined to be infeasible.

- o Air Force occupational health information system. The Air Force is presently developing an occupational health management information system. In order to ensure that to the extent possible all of the advances and "lessons learned" by the Air Force were incorporated into OHMIS, interviews were held with the developers of the Air Force system. Several important concepts, especially on the development and deployment of an information system such as OHMIS, were learned from these interviews. It is suggested that continued exchange between the DA and Air Force systems be maintained throughout the development and operation of OHMIS. Although neither OHMIS or the Air Force's system have been developed yet, it can be stated at this time that integration of the data between the two systems is, in principle, possible. This is because the recommended system design for OHMIS is such that it allows for easy integration with other data bases. If, for example, at some time in the future it appeared desirable to combine the data from the two systems on exposure to hazards and medical offense for a selected population of workers (e.g., a job class that had a relatively small number of employees in both services), this could, in theory, be done.
- o NASA's Occupational Health and Safety Information System (OMEHS). In May 1977, the National Aeronautics and Space Administration (NASA) undertook a study to determine its safety, environmental health and occupational medicine program data requirements. This project culminated in a report, "Information Requirements of the National Aeronautics and Space Administration's Safety, Environmental Health, and Occupational Medicine Programs," May 1978. This report recommended that NASA establish a computerized information system which would have the following general attributes:
  - Serve both the needs of NASA Centers and Headquarters
  - Provide computer terminals for all users
  - Be a flexible system to accommodate changes in regulations and bookkeeping requirements
  - Contain an accident and occupational illness reporting component

- Contain an inventory of toxic chemicals and other hazardous substances used by NASA
- Contain a system component for workplace monitoring and survey data
- Contain a records management component to track program activities, personnel, budgets, and training.

This effort culminated in the release of an RFP in the summer of 1981 to select a vendor who had an "operational" system which could be adapted to NASA's needs. Five proposals were submitted, three of which were evaluated. While the exact cost figures involved are not available on the public record, the estimated costs ranged from 150-300% more than NASA had budgeted for the program. As a result, the procurement was cancelled and NASA is currently re-evaluating its approach.

## 1.2 TASKS IN THE PROJECT

This Section briefly describes the procedures used to conduct the project during which this report was developed. The five tasks involved in the performance of this project, as outlined in the project Contract, were:

- "A. Identify the Army Medical Department's informational needs relating to occupational health.
- B. Evaluate occupational health software already available which might support these informational needs.
- C. Provide an analysis of these existing OH systems, identifying strengths, weaknesses, advantages and disadvantages of each.
- D. Provide and describe which of these systems are best for the stated informational needs, or, if a best system cannot be identified, provide a description of the unique system which should be developed.
- E. Provide an estimate of the resource requirements of and impact on existing facilities to implement the recommended system."

The specific approach employed to complete each of the above tasks is described below.

TASK A. One of the specific subtasks of TASK A included the review of all Federal, Department of Defense, Department of the Army, Office of the Surgeon General and Health Services Command documents related

to automation life cycle management, occupational health program requirements and medical records management. These documents took the form of regulating directives, standards, standing operating procedures and memoranda. Copies of these documents were obtained and reviewed for applicable occupational health requirements. Many of these documents are listed in the REFERENCES given at the end of this report. Section II of this report details the requirements identified during the review of these regulations.

Another subtask of TASK A involved the identification of the informational needs through visits to the five Army installations listed below:

| <u>Installation</u>                 | <u>Major Command</u> |
|-------------------------------------|----------------------|
| Fort Leonard Wood, MO               | TRADOC               |
| Fort Polk, LA                       | FORSCOM              |
| Fort Meade, MD                      | FORSCOM              |
| Aberdeen Proving Grounds, MD        | DARCOM               |
| Walter Reed Army Medical Center, MD | HSC                  |

The five installations which were visited are operated by a variety of Major Commands; this meant that a full understanding of the existing operations within the Department of the Army could be obtained. Points of contact (usually within the Preventive Medicine Activity) were arranged at each installation. These people were then supplied with a list of the types of persons that should be interviewed during the visit. The points of contact arranged appointments with each of the appropriate types of people. Visit dates were then scheduled at the convenience of each installation.

The major purposes of these interviews were to define the current procedures, estimate the potential impact on OHMIS and identify local needs and interfaces. Another important aim was to establish the degree of user interest, involvement and acceptance that could be expected for OHMIS. This knowledge will provide a basis for the implementation of the OHMIS in the future.

TASK B. Information system designers were contacted and requested to submit information about their occupational health related systems. The designers contacted were those who responded to the request for proposals by NASA (Solicitation No. W10-26508/HWC-2, Occupational Medicine, Environmental Health and Safety (OHEHS) Information System) since the USAEHA considered that proposed system as equivalent to the type of system envisioned for OHMIS. FIGURE 4-1 lists the vendors and systems reviewed.

All of the documentation/literature pertaining to these systems was reviewed and evaluated to determine the potential of each one as the "best" system to support the DA's occupational health informational and functional needs identified in TASK A. Section IV of this report supplies the findings from the review of each system.

Also reviewed as a part of TASK B were the existing governmental occupational health systems, or partial systems, including the Army-wide and installation unique systems. These systems were evaluated for their potential applicability and/or interface with the OHMIS. Sections 1.3 and 2.3 discuss these governmental systems.

TASK C. The evaluation for potential applicability of each existing system to support the informational and functional requirements of a DA OHMIS system was then conducted. This was based on the following criteria:

1. Cost of system (within constraints of a Class IV system);
2. Compatibility with proposed host hardware;
3. Interactive, on-line input and processing;
4. Ability to adapt to changing DA needs and constraints;
5. Ability to utilize existing data sources;
6. Ability to enhance the program management, audit and quality assurance of the Army's occupational health program

The results of this evaluation are given in Section IV.

TASK D. The conclusion of the review and evaluation of each available system (TASKS B and C) based on the evaluation criteria was that no existing system fulfills the minimum acceptable performance requirements of OHMIS. Therefore, the recommended system description for OHMIS, provided in Sections V through VIII of this report, is a functional description of the new ("unique") system which should be developed to meet the Army's occupational health information needs.

TASK E. Resource requirements of and impact on existing operations to implement the recommended system were prepared, based on:

1. Research and development costs;
2. Investment costs;
3. Operation and support costs.

Section VIII of this report presents these resource requirements and the system's impact on existing Army Medical Department facilities.

### 1.3 SUMMARY OF INTERVIEWS CONDUCTED

The following discussion deals with the results from the interviews conducted as a part of TASK A described above. As indicated, the

purpose of these interviews was to establish the informational and functional needs of the potential local installation users and to evaluate the constraints on and interest in participating in OHMIS by these users. FIGURE 1-1 shows a list of the persons interviewed. The review presented below is organized around the types of users interviewed and reviews the topics discussed during the interviews, the significant findings, any problems affecting OHMIS that were identified and any suggestions about the design of OHMIS proposed by the persons interviewed. The summary of the needs presented by each type of user is given in Section 2.2.

### 1.3.1 Occupational Health Nurse

Being the nucleus and primary beneficiary of any occupational health system, the Occupational Health Nurses were the focal point of much of the time spent during the visits to the installations. The individuals interviewed were all pleased to see the effort expended to improve the fulfillment of the occupational health mission. They were eager to discuss the capabilities or problems of their current systems and to identify what they would like to see in a comprehensive occupational health management information system. The following details the topics discussed during the interviews and the findings from these discussions.

- o Scheduling of Occupational Health appointments. The Occupational Health Nurses explained their current methods of scheduling appointments for medical surveillance, pre-employment and other routine medical exams. They also explained how these appointments are tracked for compliance and the procedures taken in following up missed appointments.

The methods used in the scheduling of exams involved a variety of techniques including scheduling by birth month of the employee and by the building or organization in which the employee primarily works. The procedures used in making the appointments, although all manual procedures, also varied considerably. They ranged from arranging the appointment for the employee over the phone; notifying the employee by mail that an exam was due and then having the employee phone the clinic to arrange for the appointment; notifying the supervisor that his/her employees are due for exams and having the supervisor arrange with the employees for the day and time of the appointment; assigning a time period for when an organization's exams will be given and having the supervisor of the organization arrange for his/her employees to phone the clinic to arrange for an appointment during the assigned time period.

Tracking of appointments is also accomplished manually and typically involves a phone call as a follow-up. One installation compiles a list of all "no-shows" and forwards it to the Post Commander for follow-up and compliance enforcement.



FIGURE 1-1  
NAMES OF PERSONS INTERVIEWED BY INSTALLATION AND ORGANIZATION

| Organization/Activity                                       | Names of Persons Interviewed by Installation |                                      |                          |                                    |   |
|---|--|--------------------------------------|--------------------------|------------------------------------|---|
|   | Fort Leonard Wood                            | Fork Polk                            | Fort Meade               | Aberdeen Proving Grounds           | Walter Reed Army Medical Center         |
| DHHS Contact at Installation<br>Occupational Health Clinics | LTC Reidman                                  | CPT Bogardus                         | CPT Smith                | CPT Lewandowski                    | MAJ Tedeschi                            |
|   | Mrs. Tyre                                    | Mrs. Parsons                         | Mrs. Morrison            | Mr. Esmond, M.D.                   | Mrs. Shay                               |
|   | Mrs. Pruett                                  |                                      |                          | Mr. Shea, M.D.                     | Mrs. Carrington                         |
|   | Mr. Corpolongo, M.D.                         |                                      |                          | Mrs. Hadom                         | Mr. Drusky                              |
|   | COL Washburn (1)                             |                                      |                          | Mrs. Nurse                         | Mrs. Gallaso (3)                        |
|   | Mr. Taglia, M.D. (2)                         |                                      |                          |                                    | Mrs. Beatty (4)                         |
| Industrial Hygiene  | Ms. Schall (2)                               |                                      |                          |                                    |   |
|   | Ms. Tope (2)                                 |                                      |                          |                                    |   |
|   | Ms. Anderson (2)                             |                                      |                          |                                    |   |
|   | MAJ Hanohano                                 | CPT Bogardus                         | Mr. Fowler               | Mr. Nichols                        | Mr. Steele                              |
| MEDDAC Safety Post Safety                                   | Mr. Conrad                                   |                                      |                          | Mr. Schwanke                       | --                                      |
|   | Mr. Krause                                   | CPT Prather                          | CPT Smith                | CPT Lewandowski                    | Mrs. Shelnutt                           |
|   | Mr. McKenzie                                 | Mr. Taylor                           | Mr. Nolte                | Mr. Nett                           |   |
| MEDDAC Radiation Protection                                 | Mr. Heard (2)                                | Mr. Grinnel                          |                          |                                    |   |
|   | Ms. Sappington (2)                           | Mrs. Reston                          |                          |                                    |   |
|   | LT Carroll                                   | CPT Bogardus                         | SPEC Edwards             | CPT Lewandowski                    | COL Woodward                            |
| Post Radiation Protection Hearing Conservation Officer      | --   | --                                   | --                       | Mr. Parola                         | --                                      |
|   | CPT Chandler                                 | LT Bourgeois                         | CPT Berry                | CPT Berry                          | CPT Dennis                              |
| Patient Administration                                      | CPT Ball                                     | MAJ Harasick                         | MAJ Leahy                | LT Aguirre                         | LTC Anderson                            |
|   | Ms. Close                                    | MAJ Massey<br>CPT Fogel              |                          |                                    | MAJ Kerrigan<br>MAJ White<br>MAJ Peters |
| Preventive Medicine   | LTC Reidman                                  | MAJ DuPonti                          | COL Sample               | CPT Lewandowski                    | MAJ Tedeschi                            |
| Industrial Operations Supply                                | CPT Mulvaney                                 |                                      |                          |                                    |   |
|   | Mr. Dablenmont                               | Mrs. Fee<br>Mr. Garrison<br>Mr. Bass | Mr. Greene<br>Ms. Kadlub | Mr. Sage<br>Mr. Nibel<br>Ms. Given | COL Alexander                           |
| Facility Engineers  | Mr. Nasbaum                                  | Mr. Hammersmidt                      | Mr. Criss                | Mr. Roadly                         | MAJ Schmid<br>Mr. Blivens               |

NAMES OF PERSONS INTERVIEWED BY INSTALLATION AND ORGANIZATION (Cont'd.)

| Organization/Activity                          | Names of Persons Interviewed by Installation |                     |              |                          |                                 |
|--|--|---------------------|--------------|--------------------------|---------------------------------|
|  | Fort Leonard Wood                            | Fort Polk           | Fort Meade   | Aberdeen Proving Grounds | Walter Reed Army Medical Center |
| Civilian Personnel and NAF Office              | Mrs. Keeling                                 | Ms. Haymen          | Mr. Kushiya  | --                       | Mr. Johnson                     |
|  | Ms. Dunham                                   | Ms. Schaffer        | Ms. Walker   |                          | Mr. Wells                       |
|  | Ms. Wilson (2)                               |                     | Ms. Daughety |                          |                                 |
|  | Ms. Smith (2)                                |                     |              |                          |                                 |
| Adjutant General/<br>Military Personnel Office | Ms. Ripee                                    |                     |              |                          |                                 |
|  | LT Butler                                    | SPEC Garret         | MAJ Caldwell | --                       | LTC Newberry                    |
|  | SGT Bichler                                  | SGT Dickey          |              |                          |                                 |
|  | LTC Boening                                  |                     |              |                          |                                 |
|  | LTC Howell                                   |                     |              |                          |                                 |
|  | LTC Borkowski                                |                     |              |                          |                                 |
|  | LTC Nance                                    |                     |              |                          |                                 |
| Comptroller<br>Automation Management<br>Office | LTC Gross                                    |                     |              |                          |                                 |
|  | SSG Jueneer (2)                              |                     |              |                          |                                 |
|  | Mr. Rinck                                    | MAJ Martin          | MAJ Alewmen  | Mrs. Clutter             | --                              |
|  | CPT Horna                                    | Mr. Bennett         | Mr. Bowen    | Mr. Pote                 | MAJ Bossetti                    |
|  | Mr. Hensley                                  |                     |              |                          | Mr. Crum (4)                    |
|  | Mr. Hasty                                    |                     |              |                          |                                 |
| Environmental and<br>Energy Conservation Div.  | Mr. Humphrey                                 |                     |              |                          |                                 |
|  | Mr. Batterbash                               |                     |              |                          |                                 |
|  | Mr. Hawthorne (2)                            |                     |              |                          |                                 |
|  | Mr. Auck (2)                                 |                     |              |                          |                                 |
| Chemical Systems Lab -<br>Safety               | --   | Mr. Hammersmidt     | --           | --                       | --                              |
|  |  | Mr. Hert            |              |                          |                                 |
|  |  | Mr. Smith           |              |                          |                                 |
|  |  | Fire Chief Davidson |              |                          |                                 |
|  | --   | --                  | --           | Mr. Lawhorn              | --                              |
|  |  |                     |              | Ms. Wood                 |                                 |
|  |  |                     |              | Mr. Cannon               |                                 |

FOOTNOTES: (1) Market Street St. Louis  
(2) Goodfellow  
(3) Cameron Station  
(4) Ft. Detrick

- o Services provided by Occupational Health. The services provided by the Occupational Health Nurses were fairly consistent from one installation to the next in content, e.g., in the content of the exams. The services included conducting exams, site surveys, personal protective equipment fittings and maintenance of medical records. However, the scope (degree of implementation) of the services did vary considerably between installations. For example, at some installations, all employees are tested as a part of the hearing conservation program while at other installations only those employees identified as being exposed to high hazard noise are included.
- o Population served by Occupational Health. The boundaries of the occupational health service area were discussed and found to be different from the service boundaries of the Civilian Personnel Office in all cases. In fact, during one visit, every possible combination of boundary crossover was found to exist. These differences in service area boundaries are important organization considerations affecting the design of OHMIS. It will be necessary to choose which boundaries are to define the local OHMIS service area. Possibilities include the installations, the CPO service area, or the MEDDAC's area of responsibility.

The identification of the individuals served within the occupational health service area is generally accomplished through the use of computer listings of active employees from the Personnel Offices (military and civilian). At some installations, these listings only include those employees who are in the job classes which require medical surveillance. At other installations, the listings include everyone and the Occupational Health Nurses use the lists to identify the individuals who should receive medical surveillance.

The segment of the installations' population which receives medical surveillance (e.g., all employees; only employees within job classes required to have medical surveillances; employees within job classes required to have medical surveillance plus those employees within job classes not requiring medical surveillance, but who are known to have hazardous exposures, etc.) is determined by the Occupational Health activity based on its individual understanding or interpretation of what is required by the DA occupational health program. This understanding/interpretation varies considerably between installations.

- o Interaction with Industrial Hygiene. This important interaction was present at most of the installations visited, but was generally considered to fall short of its potential. The interactions found to be present between the Industrial Hygiene activity and the Occupational Health Nurses typically involved the sharing of survey information

collected by both, Occupational Health requests for Industrial Hygiene surveys to be performed, and Occupational Health requests for information pertaining to hazardous substances. A frequent complaint was that, since the start of LOHHI, the interaction between OH and IH has deteriorated, especially with regard to the transfer of hazard information and the results of surveys from IH to OH.

- o Interaction with Personnel (Civilian (CPO) and Military (MILPO)). The Personnel Offices are sources of valuable information related to the employees (e.g., job class, birth month, etc.) that is essential for managing an occupational health program. This source of information had been recognized by the Occupational Health Nurses and arrangements had been made at all but one installation to utilize this source of personnel data. In all cases, this interaction was initiated by the Occupational Health Nurses. The OHN would request periodic printouts of the personnel data by birth month, age, job class, etc. This data is used by the Occupational Health Nurses to identify the population to be surveyed by the Occupational Health Clinic.

Another interaction with the Civilian Personnel Office involved the participation of the OHN in the preparation and processing of workers' compensation forms for injuries/illnesses incurred from job-related activities.

- o Other interactions. Although other possible interactions (e.g., with Facility Engineers, Supply, etc.) could benefit the occupational health program, no such interactions were found at the installations visited. The exception was the interaction with Safety with regard to personal protective equipment monitoring and record keeping.
- o Records flow. The 'flow' of the medical records from the time they are originated to when they are transferred/retired upon termination of the employee was discussed and did not vary greatly from one installation to the next.
- o Workload of Occupational Health. The workload (e.g., number of exams, frequency of surveys, etc.) of the Occupational Health Clinic was discussed. It was found to be primarily a function of the OHN activity's interpretation of DA policy on the size of the population to be served and the corresponding degree of implementation (scope) of the services provided. This information is important in the sizing considerations of an OHMIS.
- o Examples of forms. Copies of forms completed and/or processed by Occupational Health were obtained along with information on the 'flow' of each form.

- o Examples of printouts. Copies of printouts (if any) used by Occupational Health and information on how the printouts are generated and the sources from which they originate.

### 1.3.2 Patient Administration Division (PAD)

This group is the major source of information on the record flow and procedures related to military employee medical records. Also, this Division described the data flow for inpatient (hospital based) medical services. Great similarity between installations was found in the PAD record keeping procedures, although some differences in methods, especially storage, were observed. The following are the topics discussed and major findings.

- o Medical events data. PAD provides input to the IPDS (Individual Patient Data System). This system records the treatment and diagnoses for all inpatient medical services using the ICDA (International Classification of Diseases, Abridged) coding system. Presently, the data is batch processed and centrally maintained by HSC at Fort Sam Houston; there are plans for on-line, interactive or direct entry of this data to the IPDS data base. Historical data is maintained and is available for many past years. The feasibility of OHMIS accessing this data is very high because of the centralized nature of the system.

A significant finding was that there is currently no system equivalent to IPDS for outpatient clinic service data, including Occupational Health Clinic data. Outpatient medical service data on diagnosis, complaint, treatment and prognosis is essential to OHMIS and is the only source of medical events data (other than workers' compensation data) for civilian employees. The outpatient medical events data is manually recorded on the "patient's" (employee's) medical record; as important, this data is not coded, meaning that there is no way in which to directly input existing outpatient medical events data into a computer. In summary, the DA does not have the automated medical records system or equivalent that is necessary to immediately process this type of data and add it to the OHMIS data base. It is believed to be impractical to develop such a system for use only by the occupational health program, as an automated medical records system would impact all DA medical programs. Furthermore, the prospect of organizing a cadre of nosologists to code outpatient medical data in preparation for entering it into OHMIS is impractical for economic reasons. On the other hand, it does not seem realistic to hold up development of OHMIS pending the development of an automated medical record system or an outpatient information system. Although there are several ongoing DA and TRISMIS efforts to develop an outpatient information system, one of which may bear fruit, the interviews conducted during this project do not indicate that such a system is at all

imminent. Accordingly, the recommended OHMIS design is such as to allow the DA occupational health program to use an intermediate set of input forms for collecting outpatient medical events data, developed by the occupational health program. The planned conversion to the eventually-to-be-developed outpatient data input system (e.g., an automated medical record) is built into the recommended system design for OHMIS by the fact that the same input, data processing and output procedures are expected to be used for all OHMIS forms and, therefore, conversion to a new input form is readily done.

As a part of each interview with outpatient clinic personnel, the feasibility of having outpatient medical technicians complete the intermediate forms developed by the occupational health program to provide for medical events data input to OHMIS was examined during this project. This feasibility was reported to be high. In one interview, the format for such forms was suggested by the interviewee based on the NIH system of forms developed to address an equivalent problem. The NIH forms are multiple choice forms consisting of the ICDA codes most frequently used by the particular clinic.

This approach is recommended for OHMIS because it almost eliminates the coding problem (i.e., data comes to OHMIS in a self-coded format, except for any open-ended or "other" categories on the form). Such an approach requires the development of a separate outpatient visit input form for each outpatient clinic.

- o Central appointments/scheduling. The current and planned scheduling program (IAS and PAS) used by PAD were examined. The information about these systems was used in the development of the scheduling function of the recommended system design for OHMIS. It was not practical to simply use the existing scheduling programs in the recommended OHMIS system design because of the extensive interfacing required between the scheduling function and the other OHMIS core data processing functions.
- o DEERS (Defense Eligibility Reporting System). The interviewees at PAD frequently mentioned the use of DEERS as a possible source of data on employees for OHMIS. Accordingly, this external data source was examined. DEERS was subsequently rejected as a tool for OHMIS, however, (in favor of the military and civilian personnel systems) because: (1) it includes military dependents which are not covered by OHMIS; (2) it does not provide as much data as the other external data sources on personnel; and, (3) the quality control on DEERS data is reported to be very low.

### 1.3.3 Hearing Conservation Officer

The existing Hearing Conservation Program within the Army (HEARS) has the potential of being a complementary and independent module of OHMIS

with very few changes. The interviews with the Hearing Conservation Officers at each installation provided us with information related to the HEARS requirements, procedures and uses at the local installation level. The following are the topics discussed during the interviews with the Hearing Conservation Officers and the findings from the discussions.

- o Population serviced by Hearing Conservation Program. The populations which were served by the Hearing Conservation Program and the procedures used to identify the populations were discussed and found to vary greatly between the installations visited:
  - Some of the installations were servicing all DA personnel within the service area of the MEDDAC. This population was identified through personnel printouts of all employees.
  - Other installations were servicing those persons within occupations that require hearing surveillance according to the installation's interpretation of DA guidelines. This population was also identified through personnel printouts; printouts are requested that list only those persons working within specified job classes.
  - Still other installations were servicing only those individuals who were known to be actually exposed to noise hazards. This population is identified during surveys by the Hearing Conservation Officer, Safety or Industrial Hygiene or visits by the Occupational Health Nurses.

It was interesting to note, however, that the compliance rate (the rate of kept vs. scheduled appointments) was very high at all installations visited, regardless of the population serviced.

- o Appointment scheduling. For the most part, the appointment scheduling as well as the follow-up procedures involved telephone contact.
- o Testing and record keeping procedures. The testing and retesting procedures were discussed and found to be very consistent from installation to installation. In particular, it was found that abnormal test results (e.g., threshold shifts) were routinely followed up with retesting after prolonged periods of reduced exposure to noise. If the shift was still present, a complete audiology exam was performed.

It was found that the hearing test documents are retained for five years from the date of the most recent test. It was also noted that approximately 10% of all records are missing some sort of reference/base line data. Also, as

HEARS operates, the reference/base line information must be manually located, copied onto a new form and submitted each time a periodic exam is done.

- o Noise hazard surveys. Noise hazard surveys were performed by all of the Hearing Conservation Officers interviewed. These surveys were performed annually, without notice, and included the inspection for proper use of appropriate and adequate hearing protection.
- o Interaction with Occupational Health. Because much of the audiology equipment is located in the Occupational Health Clinics and because the Clinic staff administers many of the hearing tests, coordination is required in the timing of periodic Occupational Health exams and hearing tests. However, there is often a significant lack of coordination in the scheduling of Occupational Health versus hearing conservation appointments. Instances where the patient was scheduled for an exam shortly after or before a hearing test do occur. One of the needs that should be addressed by the OHMIS scheduling system is the coordination of all of the actions (tasks) involving the same employee (as well as those involving the same facility, organizational unit, etc.). The scheduling program needs to be able to identify those tasks already scheduled for an employee and to "look ahead" to identify those tasks that will be scheduled in the future so that the scheduling of a current task is coordinated with previously scheduled and future tasks. The recommended system design for the OHMIS scheduling function has these capabilities.
- o Interaction with Industrial Hygiene and Safety. Both the Safety and Industrial Hygiene offices help the Hearing Conservation Officer through their surveys which identify noise hazardous areas and noise exposed populations.
- o Testing equipment. The audio testing equipment was discussed and demonstrated during each interview. Either all manual or manual and automated equipment was in use at each installation. The significant distinctions noted between the automated versus manual equipment was that the manual equipment was more "foolproof" while the automated equipment has the capability to tie directly into a computer for data manipulation and storage.
- o Examples of forms. Copies of the forms completed and/or processed in the hearing conservation program were obtained along with information about the "flow" of each form.

#### 1.3.4 Troop Medical Clinic

The Troop Medical Clinics (TMC) are important to OHMIS in that they are the point of initial contact (treatment as well as record keeping) for the injuries/illnesses incurred by, and some of the routine



medical services given to, active duty military personnel. Problems with record keeping at this critical first point of contact greatly affect certain aspects of OHMIS, e.g., assurance that all injuries/illnesses are identified. The following are the topics discussed during the interviews with the Troop Medical Clinic personnel and the findings from the discussions.

- o Services provided by Troop Medical Clinic. The services provided by the TMCs were discussed and included the screening of patients, treatment of minor conditions, referrals to MEDDAC hospitals, and medical record maintenance for the troops. The feasibility of asking the TMC technician to use a multiple choice type form to record treatment, diagnosis (complaint) and prognosis of each visit for use in entry onto the OHMIS data base was discussed. It was found to be tentatively feasible because a form similar in function to this form are already being used.
- o Examples of forms. Copies of the forms completed and/or processed by the TMC were obtained along with information about the "flow" of each form.

#### 1.3.5 Industrial Hygienist

The Industrial Hygiene group of OHMIS users is important to OHMIS in that it is the primary source of information related to occupational exposures and corrective actions; these people also play a significant role in the initial recognition of hazardous working environments. The following is a summary of the topics discussed during the interviews with the Industrial Hygienists and the findings from these discussions.

- o Services provided by Industrial Hygiene. The services performed by the Industrial Hygiene activity at each of the installations visited included workplace surveys, identification of hazardous areas and technical support to the Occupational Health and Safety activity in terms of sampling and evaluation of occupational exposures. All of the Industrial Hygienists interviewed also expressed the need for and importance of their input in the review of work orders for facility designs and changes and in the selection and review of personal protective equipment. Although these additional services were not being provided by the Industrial Hygiene activity in all installations, all IH staff interviewed felt that these were services that they should provide.
- o Workplace surveys. The scheduling of routine surveys was found to be based on either a 'per building' basis, by organizational unit or by the potential severity of exposures present. Surveys are also performed 'on requests' from organizational units, Safety or Occupational Health. LOHHI surveys are also performed by the Industrial Hygiene activity. These surveys were behind schedule at most of the installations visited. Although these LOHHI surveys were

intended to be performed annually, in reality all installations visited are requiring from 2-3 years to complete the surveys for the entire installation. Many of the Industrial Hygienists questioned the usefulness of such untimely data. They also were disappointed in the lack of availability of any of the LOHHI results at the local installation level.

- o Material Safety Data Sheets. It was found that most of the Industrial Hygiene activities were not satisfied with the current MSDS data. At some installations, the MSDS was not used at all. The most recurring complaint was that frequently no MSDS is available on a given material. When this occurs, the Industrial Hygienist submits a request for the data directly to the manufacturer. The great delays and paper work associated with obtaining the needed information on the chemical properties of hazards was a frequent complaint as was the lack of a systematized method for processing this data.
- o Interaction with Occupational Health. The interviews with the Industrial Hygienists confirmed the OHN's concern over the need for better communication between IH and OH. In particular, it was found that the Industrial Hygienists would like to receive the results of the medical surveillance exams performed by Occupational Health. This information would allow Industrial Hygiene to begin to correlate occupational exposures to medical conditions for individuals or for groups.
- o Interaction with Safety. Although the importance of this interaction was recognized by the Industrial Hygienists at each installation, very little interaction actually takes place short of the dissemination of survey results. This exchange of survey information was not systematic in the installations visited. It was noted at one installation that the Industrial Hygienists should have input in the determination of the Risk Assessment Codes (RACs) for abatement actions, since the Industrial Hygienists have the expertise in occupational hazard exposures.
- o Interaction with the Directorate of Facility Engineers (DFE). The Industrial Hygienists at some installations received copies of the Space Installation Reports from DFE. These printouts were used to make up survey schedules and to determine priorities for workplace surveys. It was found that the Industrial Hygienists would also like to receive a 'printout' of all work orders submitted to DFE. This would allow Industrial Hygiene to perform a design review of the proposed modifications prior to commencement of the work.
- o Examples of forms. Copies of forms completed and/or processed by Industrial Hygiene were obtained along with information on the 'flow' of each form.

- o Examples of printouts. Copies of printouts (if any) used by Industrial Hygiene and information on how they are originated and their sources were obtained.

#### 1.3.6 Post Safety

The Safety activity at each installation is a major source of information related to occupational hazards, abatement actions and occupational injury data. This activity is also a potential OHMIS user. The interaction between Safety and Occupational Health is believed by those interviewed to be important to the success of any occupational health program. All of those interviewed within the Safety activity at each installation visited were all interested in the prospect of being a part of the OHMIS, largely because of the recognized need for easier exchange of information between the two groups. The following are the topics discussed during the interviews with the Post Safety Office and the findings from these discussions.

- o Services provided by Post Safety. The services provided by the Post Safety activity at each of the installations visited included:
  - workplace surveys
  - recommendation of abatement actions and tracking
  - injury/illness data maintenance
  - safety training/education

Each of the services is discussed below.

- o Workplace surveys. Surveys of the workplaces are generally scheduled by activity and are performed at least annually with the exception, in some cases, of the Directorates of Industrial Operations and Facilities Engineers which are surveyed more frequently. Surveys are also performed prior to the occupancy of a building by an activity. In addition to surveys, hazards present in the work environment are also brought to the attention of the Safety Activity by individuals working in the area.
- o Abatement actions. As hazards are identified by the Safety activity during workplace surveys or by individuals, the Safety activity will assign Risk Assessment Codes (RAC) and recommend abatement actions for serious hazards. The monitoring for compliance with the recommended abatement actions is often done during the next workplace survey (e.g., the following year) or it is done as a part of the routine interaction with the organization.
- o Injury/illness data maintenance. The Post Safety activity is responsible for maintaining data related to occupational injuries/illnesses occurring to personnel. This includes generating the injury reports and the OSHA Logs.

- o Safety training/education. The Post Safety activity usually provides general inbriefing of new personnel about the services provided by the Safety activity. Specific safety procedures related to a job are taught to personnel by the line supervisor. Safety meetings are also regularly held.
- o Personal protective equipment selection. Although not in effect at all installations, all of the Safety activities interviewed agreed that their office should have input into the selection and assignment of personal protective equipment.
- o Interaction with Occupational Health. This interaction was found to be very limited in all installations. Little more than the transfer of injury/illness or (occasionally) survey data takes place. In most cases, Safety allowed the OHN to be responsible for personal protective equipment monitoring and for observation of employee work practices.
- o Interaction with Industrial Hygiene. This interaction seldom involved more than the occasional sharing of survey results and request by Safety for technical support from the IH related to hazardous materials.
- o Interaction with Department of the Army's Safety Center. All of the Safety activities interviewed saw little benefit from the printouts generated by the Safety Center. Desires for comparative data from other installations and access at the local installation level were noted.
- o Examples of forms. Examples of forms completed and/or processed by Post Safety were obtained along with information on the 'flow' of each form.
- o Examples of printouts. Copies of printouts used by Post Safety and information on how they are originated and their sources were obtained.

### 1.3.7 MEDDAC Safety

In addition to the Post Safety Office, the Safety Office within each MEDDAC was interviewed in order to learn of the procedures of a Safety Office at the organizational unit level. These procedures are important in order that the interactions and delineation of responsibilities between the Post Safety activity and the organizational units' Safety Offices may be defined and understood. The topics which were discussed with MEDDAC Safety Office were the same as those discussed with the Post Safety Office. The following are the differences found between the two levels in operating procedures.

- o Workplace surveys. In many case, the Safety Office within each MEDDAC schedules monthly surveys and has a program

to recognize deficiencies on a day-to-day basis. For the most part, abatement of deficiencies were said to be arranged verbally and monitored through informal means.

- o Abatement actions. The MEDDAC Safety Office cites deficiencies, evaluates them and recommends abatement actions. Reports covering the deficiency and recommendations are submitted to Post Safety for monitoring for compliance with the recommended abatement actions.
- o Injury/illness data maintenance. The MEDDAC Safety Office is responsible for collecting and maintaining data on injuries/illnesses incurred by MEDDAC personnel. The MEDDAC Safety Office submits copies of these reports to the Post Safety Office.

Because it is within the MEDDAC, which is the source of most information on the treatment of occupational injuries/illnesses, the MEDDAC Safety Office has convenient access to outpatient logs and admission/disposition records which help to identify job-related injuries/illnesses. Many of the MEDDAC Safety Officers had recognized the value of this information and used it to help assure that all occupationally related cases were identified.

#### 1.3.8 Chemical Systems Lab Safety Office

The Safety Office within the Chemical Systems Lab at Edgewood (Aberdeen Proving Grounds) was interviewed to discuss the Work Hazard Identification Control System (WHICS). This system was identified during interviews at Fort Meade. This was the only computer based occupational health information system found at any of the five installations visited. Section 2.3 describes the WHICS system and reviews its potential applicability to the proposed OHMIS.

#### 1.3.9 Military Personnel Office (MILPO)

The proposed OHMIS will monitor the occupational health services provided to all active duty military personnel within the continental Department of the Army (CONUS). The Military Personnel Office is a major existing source of data on each military employee. Because of this, at each installation a person from MILPO was interviewed to determine the feasibility of 'sharing' this important data with OHMIS. Also of interest were the types of data currently held on each individual and the current data processing procedures. The following are the topics discussed during the interviews with the Military Personnel Office and the findings from the discussions.

- o Military personnel data. The company systems used to process the military personnel data at the local installation level (SIDPERS) as well as at DA level (MILPRSN) were discussed to identify the types of data available. Also discussed were the processing cycles and procedures, data flow, and archiving process. Copies of the forms, printouts and computer program manuals of SIDPERS and

MILPRSN were obtained. The feasibility of routinely abstracting data from the personnel data base for use in OHMIS was established. One of the major current problems with the military personnel data systems (and their civilian counterparts) is that historical data is not maintained. An occupational health program requires historical data on employees (e.g., changes in job classes) to be maintained. Therefore, OHMIS must not only abstract the information from the external personnel information systems, but also store the history of employee characteristics data on an individual in such a way that future inputs from the external data sources of personnel data may be added to (not merely replace) previous data on the same individual.

- o Service area. The geographic service area of the Military Personnel Office and that of the Occupational Health Clinic were compared because any disparity is believed to be an important consideration in defining the configuration of the OHMIS service areas. At every installation visited, the service area of the Military Personnel Offices interviewed and that of the Occupational Health Clinics were different.
- o Job descriptions reviews. The information on job descriptions, i.e., the data pertaining to what an individual actually does in the performance of his/her job is of great importance to many aspects of any OHMIS. Many data functions will depend on the classification of jobs by various factors such as types of hazard exposures. Accordingly, the availability of this type of data was evaluated at each personnel office visited. Although job description reviews are performed for military personnel, "malutilization" and outdated/inaccurate/exaggerated job descriptions for military personnel were said to exist to a considerable extent at all of the installations visited. This means that any assumptions about an employee's hazard exposures that are based on job classification information is questionable.

#### 1.3.10 Post Civilian Personnel Office (CPO)

The proposed OHMIS will monitor the occupational health services provided to all Department of the Army Civilian (DAC) employees. The Civilian Personnel Office, which provides personnel services for these employees, is envisioned as both a source of employee data and as a potential OHMIS user. The interviews were conducted to determine the feasibility of utilizing the external source of data on personnel generated by this office, what types of data are currently available, and the current data processing procedures. The following are the topics discussed during the interviews with the Civilian Personnel Office and the findings from the discussions.

- o Civilian personnel data. The computer systems which process the civilian personnel data, the types of data currently available on these systems, and the records flow from

pre-employment through transfer/termination were discussed with regard to the local installation and DA level. The processing cycles and procedures at the installation level system (SCIPMIS, i.e., the Standard Civilian Personnel Management System) and the interface with the DA level system (CIVPERSINS, i.e., the Civilian Personnel Information System) were also discussed. This included a review of the several alternate personnel systems currently used by individual organizational units in the DA, e.g., the Corps of Engineers.

- o Service area. The difference between the geographic service area of the Civilian Personnel Office and that of the Occupational Health Clinic is an important consideration to the configuration of the OHMIS service areas. The service areas of the CPOs interviewed and of the Occupational Health Clinics did not match at any installation visited.
- o Interaction with Occupational Health. The Civilian Personnel Offices at most of the installations visited supply the Occupational Health Clinic with rosters of employees to receive medical surveillance. The Occupational Health Clinic, in turn, determines fitness for duty and monitors occupational health through periodic exams of these individuals. The CPO also submits to the Occupational Health Nurses copies of diagnosis/treatment reports pertaining to job related injuries/illnesses which are completed by private physicians. The OHN, in some installations, participates in the completion of workers' compensation forms.
- o Injury/illness data maintenance. The procedures and records flow of the workers' compensation forms, which the CPO is responsible for completing, were discussed.
- o Examples of forms. Copies of forms completed and/or processed by the Civilian Personnel Office were obtained along with information on the 'flow' of each form. The computer processing manuals on SCIPMIS and CIVPERSINS were obtained and reviewed.
- o Examples of printouts. Sample copies of printouts used or generated by the Civilian Personnel Office and information on how they are generated and used and their sources were obtained.

#### 1.3.11 MEDDAC Civilian Personnel Office

Because MEDDACs are tenant units residing on installations held under other Major Commands (e.g., FORSCOM, TRADOC, etc.), each MEDDAC has a liaison who interacts with the Post Civilian Personnel Office with regard to civilian personnel matters within the MEDDAC. These liaisons were interviewed to define their role in the personnel data flow and the interaction with the Post Civilian Personnel Office.

### 1.3.12 Non-Appropriated Funds (NAF) Personnel Office

Also serviced by the proposed OHMIS are the individuals designated as Non-Appropriated Funds personnel. Therefore, a person from the Non-Appropriated Funds Personnel Office was interviewed at each installation. The following are the topics discussed during these interviews and the finding from the discussions.

- o Non-Appropriated Funds Personnel data. The types of data collected on each NAF employee was discussed as well as the processing procedures from pre-employment physicals to termination/transfer. No computer systems were found to exist for processing of NAF personnel data.
- o Service area. Again, it was found that the service areas of the NAF Personnel Offices interviewed and those of the corresponding Occupational Health Clinics did not match.
- o Interaction with Occupational Health. Although totally manual, similar systems to that of CPO for notifying Occupational Health of those NAF employees requiring medical surveillance are in effect. Occupational Health performs preplacement and periodic exams of those NAF employees identified for medical surveillance.
- o Injury/illness data maintenance. The NAF Personnel Office is self-insured for workers' compensation and, therefore, has completely different procedures and forms pertaining to occupational injuries/illnesses.
- o Examples of forms. Copies of forms completed and/or processed by the NAF Personnel Office were obtained along with information on the 'flow' of each form.
- o Examples of printouts. Sample copies of printouts used by the NAF Personnel Office and information related to their origin was obtained.

### 1.3.13 Directorate of Facility Engineers

The Directorate of Facility Engineers was interviewed at each installation as a source of data on facilities and the work environment: a crucial part of any occupational health information system. The purpose of these interviews was to determine the feasibility of 'sharing' this facilities data base with the OHMIS data base, and to identify the data which is currently available and the current data processing procedures. The feasibility of routinely abstracting facilities data for use of OHMIS was established. The following are the topics discussed during the interviews with the Directorate of Facility Engineers and the findings from the discussions.



- o Facility data. The computer system which processes facility data, the Integrated Facilities System (IFS), was discussed with regard to the data currently available, including history and archiving, capabilities of the system, processing procedures and data flow. Differences in the processing procedures or system capabilities for DARCOM installations, which were the last to utilize IFS, were discussed during the Facility Engineer interviews at the one DARCOM installation visited. An important finding was that there is no existing data system for linking employees to their work site. This type of information is crucial to an OHMIS system and is one of the major types of new data that will need to be supplied by the OHMIS system. What is needed is a system for notifying OHMIS of changes in personnel status (e.g., changes in job class) that should trigger a check to determine if this status change also means a change in the location of the employee. Also, the OHMIS system should be designed so that every contact between a DA employee and the occupational health program includes collection of data on the current work location of the employee. The recommended system design for OHMIS enables these functions to be performed by OHMIS.
- o Work orders. Work order data (i.e., data on requests for modifications/repairs/additions to facilities) is important to the OHMIS because it identifies changes to the work environment and thereby changes to the employees' exposures. Work order data also provides a means of monitoring whether abatement actions have been implemented. The procedures for processing this data and the data flow for work orders were discussed. Also discussed was the method of classifying work orders as 'safety related'. This has two aspects: (1) A work order can be generated as a result of a need to address an existing safety/health problem. (There is a method for identifying these work orders, but the quality control on this classification of work order is reported by all to be very poor.); (2) The change made in the work environment as the result of a work order can affect the safety/health of the work environment. (There is no systematic method for identifying this type of work order although all IH personnel interviewed indicated the need for a notification system about work orders that would trigger an investigation by the IH to determine the effects of the change in the work environment covered by the work order).
- o Examples of forms. Copies of forms completed and/or processed by the Directorate of Facility Engineers were obtained along with information on the 'flow' of each form. Copies of the manuals on IFS were also obtained and reviewed.
- o Examples of printouts. Sample copies of printouts generated or used by the Directorate of Facility Engineers were obtained.

#### 1.3.14 Directorate of Industrial Operations - Supply

The Directorate of Industrial Operations - Supply is another source of OHMIS data. This organization provides data on supplies which can be used as the primary external data source for data related to hazardous materials. The interviews were conducted to determine the feasibility of utilizing this source of existing data, the types of data currently available, and the current data processing procedures. The following are the topics discussed during the interviews with the Directorate of Industrial Operations - Supply and the findings from the discussions.

- o Supply data. The Standard Army Intermediate Level Supply System (SAILS) is the computer system which processes the supply data at each installation. SAILS was discussed and information pertaining to the types of data available, procedures for processing, and system capabilities was obtained. An important finding was that there is no existing external data source for data linking supply (hazards) data to the location in which the item is used or stored. This type of linking data is crucial to an OHMIS system and is currently partially supplied by the LOHHI system. However, the fact that there is no external data source that tracks the location of supplies means that the current major weakness of LOHHI will need to be solved by OHMIS. (Specifically, OHMIS will need to resolve the problem of the untimeliness of the LOHHI data that is due to the lack of a method of incrementally updating the data, that is, updating it as changes in hazards occur. What is required is a method for notifying the Industrial Hygienist of the need for a check for changes in exposures to hazards that is automatically triggered by information that is available for external data sources, such as information on the supplies ordered by an organizational unit. An automated system for doing this is provided in the recommended system design for OHMIS. The forms, printouts and computer processing manuals (including the code books) for SAILS were obtained and reviewed.
- o Local purchases. Procurement of nonstandard materials was discussed and found to be very difficult to monitor through current procedures. It was explained that materials could be purchased without documentation on SAILS or any other system.
- o Hazardous materials. The identification and tracking of hazardous materials was discussed during each of the interviews. It was noted that a limited means of identifying hazardous materials through the coding system used in SAILS does exist.

#### 1.3.15 Management Information Systems Office (MISO)

As the potential host of the OHMIS software, the MISO was interviewed to evaluate the feasibility of the OHMIS being maintained by MISO as

compared to being maintained within each MEDDAC. The reaction to the prospect of operating another system, even with the expected size of OHMIS, was favorable for the most part. The following are the topics discussed during the interviews with the MISO and the findings from the discussions.

- o Hardware configuration. The installations' current hardware configurations were discussed as well as the possible conversion to the VIABLE network. All but one of the installations visited are scheduled to receive the VIABLE configuration and software. The approach of having the OHMIS reside on VIABLE was discussed with each of the MISO directors and was uniformly declared to be "the way to go."
- o Software systems currently operated by MISO. Lists of the Standard Army Systems and the systems unique to each installation were obtained along with descriptions of the purpose and capabilities of each system. The potential interface between OHMIS and many of these software systems was also discussed. It was noted that extraction of data through the utilization of 'front or rear end programs' would be possible. The feasibility of generating 'byproduct' tape data for OHMIS from other external data sources on the base operations computer systems was supported by all.

#### 1.3.16 Environmental and Energy Conservation Division (EECD)

This team of individuals is a source of data pertaining to accidental exposures (e.g., spills) to hazardous substances within the installation. The team was identified through other interviews and was only found one of five installations visited. The following are the topics discussed during the interview with the Environmental and Energy Conservation Division and the findings from the discussions.

- o Services provided by EECD. This team of engineers and emergency response personnel (e.g., firefighters) is responsible for responding to accidental hazardous exposures. They evaluate and document the circumstances and impact of this type of incident, both to the environment and to personnel (including themselves). The resulting data on hazardous exposures would be a valuable supplement to the routine exposure data collected in OHMIS.
- o Examples of forms. Copies of the forms completed and/or processed by the EECD were obtained along with information on the 'flow' of each form.

#### 1.3.17 Comptroller

The Comptroller at each MEDDAC was interviewed as a source of information for defining the MEDDAC's service area boundaries. This

information is necessary in defining the OHMIS network configuration. The following are the topics discussed during the interviews with the Comptroller and the findings from these discussions.

- o Service area boundaries. The service area within the responsibility of each MEDDAC was defined during the interview. This boundary was then related to the similar service area boundaries for the Personnel Offices. The boundaries were found to be different in all cases and every possible combination of overlapping boundaries was observed.
- o Table of Distribution and Allowances. The Comptroller was also used as a source of information on the procedures involved in the assignment of personnel and in the classification of personnel.

I

SECTION II - IDENTIFICATION OF OHMIS FUNCTIONAL REQUIREMENTS  
AND NEEDS

## II. IDENTIFICATION OF OHMIS FUNCTIONAL REQUIREMENTS AND NEEDS

In this Section, the various functional requirements and needs that must be met by OHMIS are described. Three sources were used to identify the needs of the DA in an occupational health information system: (1) the requirements for an OHMIS implied by occupational health and automated data management regulations; (2) the needs expressed by the potential users of OHMIS; and, (3) the needs that arise from some of the problems or favorable features of the current DA information systems.

The needs identified in this Section are used to develop the use modules described in Section III on which the design of OHMIS is based.

### 2.1 REGULATORY REQUIREMENTS

Two types of regulations were reviewed to identify the functional needs of OHMIS. These were: (1) occupational health regulatory requirements; and (2) DA requirements concerning the automation life cycle management process.

#### 2.1.1 Occupational Health Regulatory Requirements

To ascertain the data requirements applicable to OHMIS, a careful examination was made of all known applicable Department of Defense, Department of the Army and Department of Labor Directives, Instructions, Regulations and Standards. The potential data requirements of each of these documents were extracted, categorized and compiled into a generic list of data types. The subsequent recommended system design for OHMIS is structured to handle each data item and the interaction between data items. It will be necessary to load the actual requirements into the OHMIS data base prior to operation of OHMIS and to establish the user procedures for periodically updating these requirements data. The data processing (input, change, delete, examine) for handling requirements data (as distinguished from the user procedures) is contained in the recommended system design for OHMIS. This includes the data processing required for having the OHMIS system automatically identify when requirements are applicable and trigger and schedule the actions (tasks) associated with these requirements.

The generic list of data items needed for identifying and monitoring requirements is outlined below. The core data processing functions for handling requirements in the recommended system design for OHMIS have been designed to input these data elements, to trigger the required actions based on the values for these data elements, and to monitor completion of the required actions.

- o Training requirements may need data on:
  - The nature of the work of assignment;
  - The nature of the equipment or materials used;
  - The action level for the substance or material involved (i.e., for those persons exposed to a substance at or above 'X' level);
  - Initial and recurring requirements (i.e., an initial training requirement 'X' days before assignment and then repeated after fixed or variable time periods).

The data elements required for specifying requirements in each of these formats must be included in OHMIS.

- o The curriculum of training programs may need data on:
  - The nature of the work assignment;
  - The engineering controls in place;
  - The contents of formal safety programs;
  - The type of medical monitoring in place.
- o Licensing and certification data needs include:
  - One-time, initial and recurring certification and recertification;
  - The nature of the work and materials.
- o Workplace inspections and monitoring may include the following types of requirements and the corresponding data elements:
  - Specific test requirements based on substances involved;
  - Accurate requirements within 'X' percent based on substances involved;
  - Specific, fixed time interval schedules;
  - Varying schedules based on monitoring results (the frequency may be increased to 'X' intervals and shall continue until at least 'X' consecutive measurements taken 'Y' days apart are below the action level);
  - The need to initiate or increase medical monitoring when an action level is reached and to suspend or decrease the medical monitoring when the action level is no longer exceeded;

- The need to notify employees at 'X' action level;
  - The need to recognize changed monitoring requirements when: processes or materials change, controls change, or personnel are added or deleted;
  - The need to monitor the calibration of monitoring equipment at fixed or varying intervals;
  - The need to record workplace discrepancies and monitor the status of corrective actions;
  - The need to maintain records of monitoring activities which may include: dates, duration, location, and results of samples taken; descriptions of procedures used to obtain representative samples; identification of employees to whom the sample applies and identification of the type of personal protective equipment, if any, in use at the time; and potential environmental variables which may affect the sample;
  - Records retention variables include storing the data for 'X' years or duration of employment plus 'Y' years, whichever is longer.
- o Medical surveillance requirements may vary depending on data input to the system about:
- Simple exposure to a substance or energy, or exposure over 'X' time and at 'Y' level;
  - Potential exposure to 'X' substance or energy.
- o Variation in the requirements for frequency and type of medical examinations are specified in the following terms or formats:
- By age;
  - Duration of exposure;
  - Results of a specific test(s);
  - 'X' days after initial employment before initial assignment;
  - At 'X' intervals as specified in a standard or regulation;
  - Upon detection of a symptom;
  - An injury or illness requiring 'X' amount of hospitalization of 'Y' days away from work;



- 'X' months preceding termination of employment;
- As dictated by workplace monitoring;
- By discovery of an abnormality and/or removal from exposures.
- o Retention of medical records may vary by duration of employment or termination plus 'X' years as dictated by employment exposures
- o Documentation concerning the use of hazardous materials should include:
  - Identification of the substance;
  - Amount involved;
  - Where used;
  - How long used;
  - Retention of data for 'X' years depending on the substance.
- o Occupational illness reporting requirements include:
  - Diagnosis categories;
  - Severity in terms of fatalities, lost work days, restrictions to normal work activities, terminations or transfers;
  - Causal factors;
  - Rates by man-hours worked.

#### 2.1.2 Automation Life Cycle Management Regulatory Requirements

To ensure the development of cost effective and standardized automated data systems, the Army has promulgated a series of Army Regulations and Technical Bulletins which set forth Army policies and technical requirements. The development, deployment, and operation of OHMIS must consider and apply each applicable provision. Outlined below is a synopsis of the applicable Army documents which have applied to the system design outlined herein:

- o AR 18-1, Army Automation Management - Describes the basic policies and responsibilities for the management of Army automation.
- o AR 18-12, Catalog of Standard Data Elements and Codes - Prescribes approved data elements for use in all Army information and data systems.

- o AR 105-22, Telecommunication Requirements Planning, Developing, and Processing - Provides the procedures for submission, validation and approval of ADP telecommunications requirements.
- o AR 340-2, Maintenance and Disposition of Records in TOE Units of the Active Army, the Army Reserve, and the Army National Guard - Prescribes the disposition of personnel, inspection, police, training and supply files, thus delimiting access to OHMIS background data.
- o TB 18-100, Army Automation Life Cycle Management - Prescribes the life cycle management of Army ADP projects. Directly applicable to the next phase of OHMIS are the sections on:
  - Mission Element Need Statement - (MENS)
  - System Decision Paper - (SDP)
  - Management Plan - (MP)
- o TB 18-101, Army Automation Planning, Programming and Evaluation System - Provides for the management of financial aspects of ADP procurement and operation. As such it is of primary interest to the project officer.
- o TB 18-103, Software Design and Development - The provisions of this TB are mandatory for all new software design and must be incorporated in any procurement document. The TB provisions are too detailed to set forth in a synopsis but include ADP analysis and design, design techniques, data base management systems, privacy (AR 340-21) and ADP security (AR 380-380). System designers must be totally familiar with the provisions of this TB.
- o TB-106, Deployment, Operations and Termination of Automated Data Systems - Prescribes standard operating procedures for the life cycle management of ADP systems. The milestone procedures for deployment of a new system should be integrated into the FY 86-87 Management Plan.
- o TB-109, Army Automation Economic Analysis - Sets forth requirements and techniques for analysis of alternative systems. See Section IV of this report for the actual analysis of OHMIS.
- o TB-110, Army Automation Configuration Management - Sets forth procedures for controlling the ADP hardware and software throughout the life cycle of the system. A configuration management plan, tailored to the scope and technical characteristics of OHMIS should be developed in conjunction with the initial programming effort and updated as required throughout the OHMIS life cycle.

- o TB 18-111, Army Automation Technical Documentation - Implements the documentation requirements of DoD Standard 7935.1-5, and its provisions should be incorporated in any programming contractual document.
- o TB-112, Training Management for ADP Systems - (Not yet available.)
- o TB 18-114, Computer Performance Measurement and Evaluation - Provides hardware and software optimization PME techniques. While primarily applicable to existing systems, its use would enhance the value of the initial installation test and evaluation.

## 2.2 NEEDS OF POTENTIAL OHMIS USERS

The user needs that must be met in the design of OHMIS were identified primarily during the installation visits described in Section 1.3. These visits covered the local user needs. In addition, interviews were held with DA and HSC policy makers and management level persons to identify their needs. The OHMIS needs expressed by the management level and their local installation level potential OHMIS users are summarized below.

### 2.2.1 Management Level User Needs

At the senior management level of the Army Occupational Health Program, defined as the Office of the Surgeon General and the Health Services Command (through its operating arm, the U. S. Army Environmental Hygiene Agency (USAEHA), the primary users' needs encompass that information needed to plan, program and control the system. In terms of OHMIS these needs include:

- o The ability to specify the criteria and requirements of the occupational health program and to ensure they are implemented in a timely manner;
- o The ability to assess the impact of new or proposed criteria in terms of fiscal or manpower resources. This requirement dictates the ability to assess potential exposures to regulated substances or processes;
- o Assess, specify and allocate personnel and fiscal resources based on need;
- o Have access to exposure data for use in epidemiological studies and trend analysis;
- o Perform audit reports on the performance/workload of selected installations, MACOMs or on an Army-wide basis;
- o The ability to compile and generate Army-wide reports on specific activities as well as occupational illnesses;

- o The ability to track the status of abatement actions so as to monitor performance and develop budget inputs.

Meeting these centralized needs will be an inherent facet of OHMIS because of the proposed centralization of OHMIS data and the ability to access, compile and analyze data from the five VIABLE Regional Data Centers and the HSC Computer Center (probably the center at Ft. Detrick; possibly the Center at Ft. Sam Houston).

#### 2.2.2 Local Installation Level User Needs

This Section discusses the needs expressed by the primary and indirect users of OHMIS as identified during the visits to the five installations. These users include: Occupational Health Nurses and Physicians, Industrial Hygienists, Radiation Protection Officers, Hearing Conservation Officers, Safety Officers and Personnel Officers. Their 'needs' were typically expressed through suggestions or 'wish lists' covering capabilities for consideration as functions of the proposed OHMIS. In many instances, these suggestions simply involved proposed solutions to existing problems.

##### o Needs Expressed by the Occupational Health Nurses and Physicians:

- 1) Better interaction/interface with Safety and Industrial Hygiene in terms of shared information;
- 2) Ability to ensure that all persons requiring and/or needing medical surveillance are identified and serviced;
- 3) Better definitions of who should be included in medical surveillance (e.g., those persons exposed versus those persons in occupations believed to be exposed);
- 4) Better methods of identifying the hazards to which each individual is being and has been exposed;
- 5) Ability to easily (automatically) analyze and correlate symptoms to exposures;
- 6) Better guidelines for determining whether individuals are fit for duty (i.e., more information on local requirements within job class);
- 7) More comprehensive testing for fitness for duty, e.g., stress testing, ergonomic testing, etc.;
- 8) Method of identifying and tracing former employees who were exposed to substances/processes which have only been recently identified as being health hazards;

- 9) Involvement in the return to work processing for employees who were injured/ill;
  - 10) Continuing health services education.
- o Needs Expressed by the Hearing Conversation Officers:
- 1) Better interaction/interface with Industrial Hygiene and Safety with regard to the identification of noise hazardous areas;
  - 2) Ability to perform analyses of and correlations of trends in audiometric test results for any previous data, not just reference/base line;
  - 3) Local use of computerized data.
- o Needs Expressed by the Radiation Protection Officers:
- 1) Method of ensuring that all persons who are exposed to sources of radiation are included in the radiation dosimetry program;
  - 2) Better inprocessing/outprocessing procedures to ensure that previous exposure records are received and current records are forwarded;
  - 3) Better response time on dosimetry readings. (Currently the response time is 2 to 3 months, which has the potential problem of allowing persons to become or near overexposure levels, before the need for preventive actions can be identified.)
- o Needs Expressed by the Industrial Hygienists:
- 1) Better interaction with Occupational Health and Safety with regard to shared information;
  - 2) Method of maintaining up-to-date hazards inventories;
  - 3) Local access to LOHHI data;
  - 4) Involvement in the selection of personal protective equipment;
  - 5) Involvement in the design review of building modifications and construction;
  - 6) Involvement in the assignment of Risk Assessment Codes for deficiencies.

o Needs Expressed by the Safety Officers:

- 1) Comparative analysis of injury/illness experience between installations of similar and different operational characteristics;
- 2) Ability to share knowledge between installations related to corrective actions and their effectiveness.

o Needs Expressed by the Personnel Officers:

- 1) Method of analyzing/correlating excessive sick leave trends;
- 2) More detailed hiring criteria for local job descriptions including personal capabilities and building characteristics (for access by disabled persons);
- 3) More systematic and more automated method of processing workers' compensation data.

## 2.3 PROBLEMS AND FEATURES OF CURRENT ARMY SYSTEMS

This Section reviews the current Army systems (both DA-wide and local) which are related to the implementation of the proposed OHMIS. The major features and weaknesses are described. This information was used to identify some of the needed characteristics of the new OHMIS.

### Army-Wide Systems

o LOHHI

Background information on the LOHHI projects is presented in Section 1.1.1 of this report.

Significant drawbacks of the LOHHI systems, as currently implemented, relate to the initial concept of the system as a "one-shot" data collection effort to determine the numbers of people exposed to hazardous materials and the types of materials to which they were exposed. This concept has a weakness as an ongoing system because maintaining current data depends on the ability of the local installations to perform detailed surveys regularly. This was found to not be achievable at all of the installations visited. The cycle for LOHHI surveys was approximately every three years in the installations visited; three-year-old hazards information may have some value as a one-time measure of the type and degree of hazardous exposures in the DA, but it is of questionable value in the management of an occupational health program. LOHHI II has broadened the objectives of LOHHI by including the identification of the individuals exposed to hazards, in addition to the numbers of persons exposed collected in LOHHI I. This more detailed data has not resolved the problem of outdated data; in fact, the value of noncurrent data on individuals is perhaps even more

questionable than outdated hazards information alone. What is needed is a method for identifying potential changes in hazardous exposures and a process by which investigation of these changes is triggered. This would mean that DA hazards data would not depend on the periodic surveys, but would be continually and incrementally (i.e., only selected items of data) updated. Such a system would require organizing the hazards data base in such a way that a series of data elements on an individual (employee, facility, hazard) could be collected and stored at different intervals than the data collected for other individuals. The core data processing in the OHMIS recommended system design provides for these features.

Another major weakness of the system as currently implemented is the inability to manipulate, at any level, the data which is collected (only dumps of the data are available). Yet a third weakness is the lack of access and ability to utilize the LOHHI data at the local installation level. Direct access to the LOHHI data for their OHMIS service area by local users and the ability to generate outputs based on user specified queries are recommended features of OHMIS.

o HEARS

Background information on the HEARS project is also presented in Section 1.1.1 of this report.

The HEARS system seems to have an exceptionally high compliance rate (almost 100% compliance in most of the five installations visited). This strong foothold is said to be a result of the management level emphasis on the program, which is due to the estimated \$1 million in hearing loss claims per year to the DA.

However, there are weaknesses in the system, as described during the interviews with the Hearing Conservation Officers at each installation. The most significant weakness is the inaccessibility of the HEARS data on the local level. Another problem noted is the lack of reference/baseline measurements on many of the records. This lessens the ability to perform meaningful trend analyses of threshold shifts. It was also noted that the data collection form for the hearing tests required 15-20 minutes to complete while the test itself usually took half as much time.

o Radiation Protection Program

The Radiation Protection Program within the Army maintains the radiation exposure records and the film badge program for those individuals incurring exposure to ionizing radiation. These exposure records detail the amounts of radiation exposure each individual has received during a specified time period. These records are generated as a

result of the film badge program which involves the issuance of dosimetry badges to measure the amount of radiation received. The amount of radiation received during the time period as well as the cumulative amount are monitored to ensure that no individual receives an overexposure.

One major problem with the radiation safety program as noted by the Radiation Protection Officers includes the delay incurred for the film badges to be processed (sometimes 2 to 3 months). Excessive delays in the processing of the exposure measurement could lead to an overexposure that may have been avoidable if current cumulative measurements were available. Another significant problem noted is with the in/outprocessing procedures. Many (estimated to be as high as 90%) of the individuals within the radiation protection program fail to obtain copies of their previous exposure records or neglect to collect their current records prior to transfers. This results in excessive paperwork for the Radiation Protection Officer in obtaining previous records and forwarding current records. Direct access to the data by authorized personnel at the local level, a local user query system for this data, and replacing manual transfer of records with an automated system in which the RSO can retrieve an exposure history on an individual at any time and from any location are features that should be included in the new OHMIS system design.

#### Local/Installation Unique System

##### o WHICS (Work Hazard Identification Control System)

The WHIC System is operated by the Safety Office of the Chemical Systems Lab at the Edgewood Area of Aberdeen Proving Grounds. The system is used to maintain records on work related exposures (both stress and chemical) to an individual. These records are completed quarterly (updates are meant to be submitted as they occur) by each individual and reviewed/verified by the administrative person responsible for the individual. The records are then processed and available for review by the Occupational Health Nurses and Physicians. The Occupational Health Nurses and Physicians use the exposure data to determine the content of the medical surveillance examinations performed on a given individual as well as to help identify those individuals requiring medical surveillance.

While WHICS has many outstanding features, there are some significant problems with its current operation. One particular problem includes the lack of any historical data on exposures to individuals (not even a hard copy). Possibly the most significant problem with WHICS is the pending responsibility issues. During a manpower survey, the operation of WHICS was determined to be a medical rather



than a safety function and the Safety Office of the Chemical Systems Lab was required to relinquish operation of the system to the local Medical Activity.

o Occupational Environmental/Health System (OE/HS)

During the visit to Walter Reed Army Medical Center (WRAMC), the Occupational Environmental/Health System was reviewed. This system is in the implementation phase and will be used to generate notices to individuals of the periodic medical exams that are due; notices to supervisors identifying their employees requiring medical exams; and, a Control Register/Schedule for use by the Occupational Health Clinic. Each of the outputs from the OE/H System includes the test requirements for each individual.

o Patient Registry System

Another system identified during the visit to WRAMC was the Patient Registry System. This system will eliminate the need for users to repeatedly input basic identification and demographic data (registration data) for each patient. The Patient Registration System captures this basic data in a form that can be retrieved and linked to the next entry on the individual, thus reducing the user clerical workload.

o Medical Record Tracking System

Also identified during the visit to WRAMC was the Medical Record Tracking System. This Record Tracking System (RTS) maintains a log of all charts in circulation. Circulation is defined as the state of any physical chart that has been checked out of the Medical Records Department. The RTS allows qualified personnel who have access to CRTs to issue requests for patient records and to generate a prioritized request in the file room.

The RTS performs the following functions:

- 1) Provides for the user, on demand, the location of any patient chart whether checked out to a location or inside the file room.
- 2) Maintenance and creation of a master Destination/Location file. The Destination/Location file is shared with the Radiology Film Locator System.
- 3) Recognizes individual records by Record Type. This is done through the use of a record identifier defined by the MTF, a two-digit volume number, different Family Member Prefixes (FMPs), date of birth and Social Security number. Tracking in the Radiology System is performed in a like manner, except the Insert Category is tracked instead of Record Type.

- 4) Provides daily list of overdue charts.
- 5) Generates circulation statistics.
- 6) Provides a purging/retirement routine.
- 7) Provides single and multiple pull lists, and the ability to override or delete requests after having been placed.

These are features worth considering in OHMIS. However, the feasibility of a medical record tracking system that is only used by the Occupational Health activity may not be high.

#### 2.4 SUMMARY OF NEEDED OHMIS CAPABILITIES

In this Section, the functional requirements and needs that must be met by OHMIS are summarized.

At present there is no existing overall ADP system to assist in the management of the Army occupational health program. The establishment of OHMIS thus provide the Army with a new capability. Also, it should upgrade the existing capabilities of LOHHI and HEARS. The new capabilities provided by OHMIS should include:

- o An ability to link the hazards of a facility to the medical data of the personnel who work in that facility. This most significant capability permits Industrial Hygiene, Occupational Health and line supervision personnel to work as a team in the identification and correction of health hazards.
- o Improvements in the areas of standardization and productivity following from the institution of an ADP system that has outputs that can be monitored from a central location.
- o Improved ability to compare installations and early detection of trends.
- o Increased capability to perform retrospective epidemiological studies through analysis of standardized archive data.
- o Elimination of most manually prepared reports which are developed from numerical data.

More specifically, OHMIS should provide the capability to:

- o Specify criteria/requirements for:
  - scheduling of medical surveillance events
  - medical exams content
  - acceptable result levels from tests
  - job placement
  - scheduling of surveys
  - survey content
  - acceptable result levels from sampling
  - program (OH, IH and OHMIS) performance
- o Generate audit reports of performance (planned versus actual performance)
- o Specify staffing resources
- o Generate medical exam schedules based on exam requirements and staffing resources
- o Schedule referral lab work based on exam results
- o Generate notices regarding medical exam results
- o Maintain historical medical data on-line for use in trend analysis
- o Generate workers' compensation data
- o Monitor for delinquent medical exam appointments
- o Generate employee characteristics profile by facility for use during walk-through surveys
- o Generate tabulations of occupational health and industrial hygiene services performed for a specified time period
- o Specify IH criteria/requirements for survey content, frequency, sampling criteria, results of sampling, and hazard controls for those requirements unique to the installation
- o Generate IH survey schedules based on survey requirements of a given facility/organization/process
- o Generate notices of scheduled IH surveys automatically

- o Generate facility profiles/worksheets for use during IH surveys
- o Maintain current computerized data base on facilities/ processes/material and their related hazards for trend analysis
- o Recommend applicable abatement actions for common hazards
- o Record abatement actions by type of hazard, type of corrective action and RAC code priority
- o Record and track status of recommended abatement actions
- o Schedule periodic/recurring IH actions based on frequency requirements
- o Generate a list of all hazardous materials procured by organizations within the installation for investigation/ survey as appropriate
- o Generate a list of all organizations procuring a given hazardous material
- o Generate a list of all facilities modified within the installation and schedule applicable reviews
- o Generate a list of all new facilities and schedule applicable design reviews

### SECTION III - INFORMATION SYSTEM USERS AND USES

### III. INFORMATION SYSTEM USERS AND USES

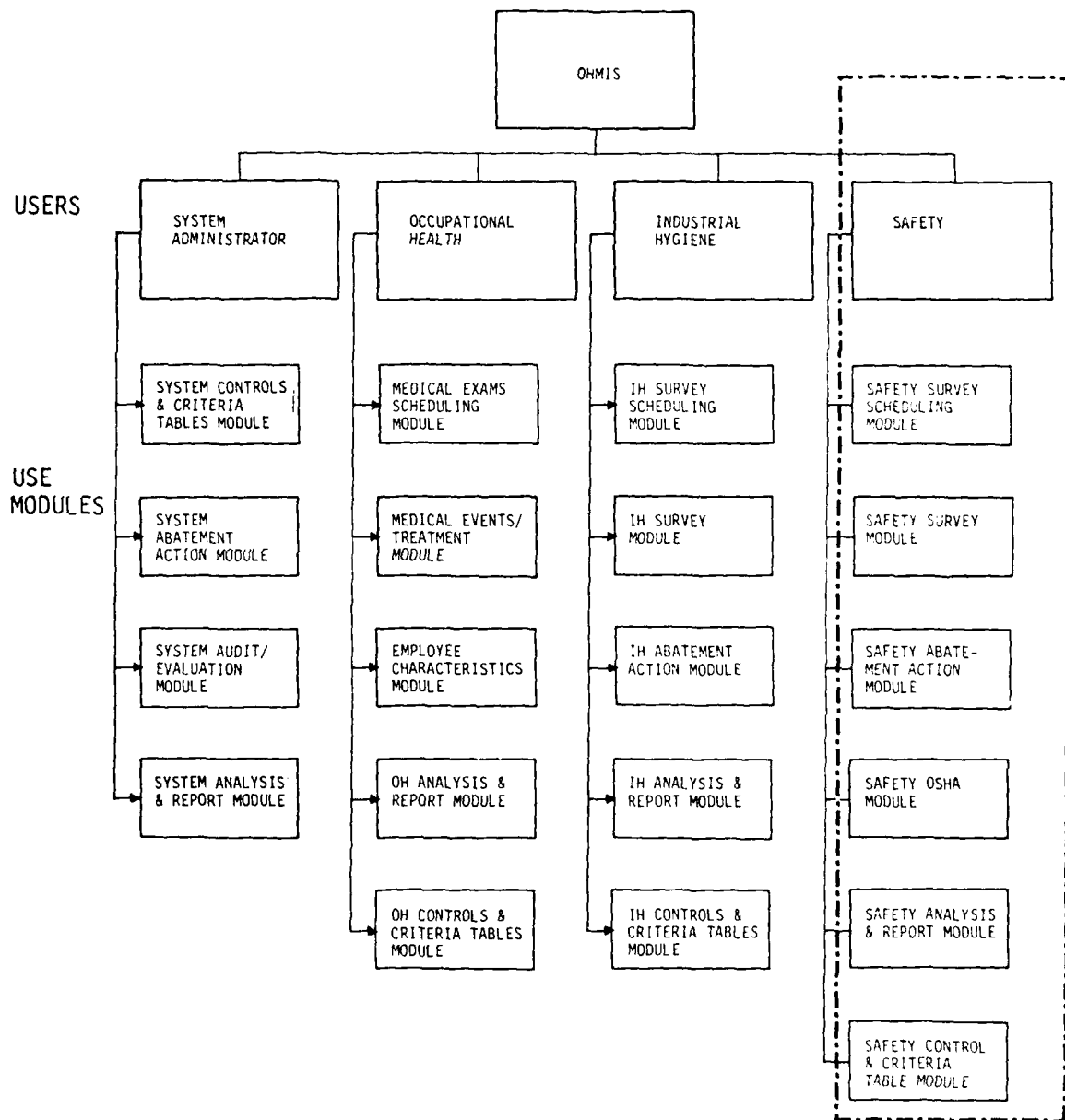
In this Section, the needs identified in Section II are summarized and grouped together by the four major types of OHMIS users. For each OHMIS user, the needs are converted into uses, i.e., the ways in which an ideal occupational health information system would be used if it were to meet all of the user's needs for operating an occupational health program. The uses for each OHMIS user have been grouped together into what are called use modules for quick identification of similar uses. FIGURE 3-1 shows the four types of users and the use modules for each type of user. The identification of the use modules for each OHMIS user form the basis on which the recommended system description for OHMIS was developed. In particular, it was the fundamental underlying similarity in the data processing function of all of the uses of an information system in an occupational health program, as identified in these use modules that led to the formulation of the 11 core OHMIS data processing functions described in Section VI.

#### 3.1 SYSTEM USERS

In the review of user needs described in Section II, it was found that the needs naturally grouped themselves by the type of users of an occupational health information system. Four major types of users were identified. These are referred to as:

- 1) System Administrator User Group: This is the management level user of an occupational health information system, e.g., the user at the DA or Major Command level. The fundamental roles of the System Administrator group of OHMIS users will be to develop and specify all of the DA-wide (or command-wide) operating requirements and criteria of the Department of the Army's occupational health program; to translate these requirements/criteria into their implications for the operation and maintenance of an occupational health information system; to use the OHMIS system to monitor compliance with and evaluate the effectiveness/feasibility of these requirements/criteria; and, to take actions to address failures to comply with or inadequacies of these requirements/criteria, including modifications to the requirements/criteria.
- 2) Occupational Health User Group: This group of users includes the Occupational Health Physician and Occupational Health Nurse as well as the entire array of medical technicians and paraprofessionals involved in providing occupational health services to DA employees, both military and civilian.
- 3) Industrial Hygiene User Group: This group of users refers to the entire array of Industrial Hygienists, Technicians, and hazard specialists (e.g., Radiation Safety Officers) involved in the identification, monitoring and control of

FIGURE 3-1  
USERS AND USE MODULES



occupational health hazards to which DA employees are exposed.

- 4) Safety User Group: This group of users is equivalent to the Industrial Hygiene User Group, except that these persons primarily address occupational safety, as distinguished from occupational health, hazards. This is an optional group of users in the OHMIS system in that participation of the safety users in OHMIS is desirable, but not necessary, for its operation. The very great similarity in many of these uses of an occupational health information system between the Industrial Hygiene and Safety User Groups suggests that shared use of the OHMIS system by these two groups would be beneficial and feasible.

The uses of an occupational health information system for each of the first three of the above OHMIS users are given below. For each user, a series of use modules are identified (see FIGURE 3-1) and then the specific uses covered under the module are briefly reviewed. In describing the use modules, the tone used is to explain the major ways in which each user would use OHMIS if the system were already in place.

### 3.2 SYSTEM ADMINISTRATOR USE MODULES

The four System Administrator use modules described below cover the management level uses of OHMIS. These include the use of OHMIS to perform and monitor all of the uses applicable to the Occupational Health and Industrial Hygiene users. However, the System Administrators' use of the system would not be limited to the boundaries of a single installation as would the local users. All System Administrator uses of OHMIS apply to the access, inquiry, and output of data for:

1. a given installation;
2. a group of installations or a command (e.g., HSC); or
3. all CONUS installations.

Similarly, the uses that should be covered by OHMIS for System Administrators enable the central definition of criteria and performance requirements for the following:

- o scheduling of medical surveillance exams
- o medical exam content
- o acceptable results levels from tests
- o job placement
- o scheduling of surveys
- o survey content



- o monitoring criteria
- o program performance (OH, IH and OHMIS)
- o report generation

The definition of the criteria and performance requirements may apply to a single installation, a group of installations or command, or DA-wide. The criteria and requirements defined by the System Administrators will take precedence over the local Occupational Health or Industrial Hygiene defined requirements and criteria.

### 3.2.1 'System Controls and Criteria Tables' Use Module

The System Controls and Criteria Tables Use Module covers the use of OHMIS by management level users to centrally define and maintain the criteria and performance requirements of the system. This group of uses also includes defining of log-on/password procedures for the local installation activities.

This use module also covers the performance of an audit trail function to "backtrack" transactions in the event of system failure.

#### OHMIS USES COVERED IN THE 'SYSTEM CONTROLS AND CRITERIA TABLES' USE MODULE

- o Enter DA or installation specific criteria for allowable limits for medical tests and monitoring.
- o Enter DA or installation specific requirements for medical surveillance activities and surveys (e.g., scope, content and frequency).
- o Enter DA or installation specific job placement requirements.
- o Enter authorization table data for procurement criteria for hazardous materials.
- o Enter performance criteria for DA or installation specific OH and IH activities.
- o Enter log-on/password table assignments.
- o Generate audit trail.

### 3.2.2 'System Abatement Action' Use Module

The System Abatement Action Use Module covers the review of data on deficiencies cited during surveys, the assignment of risk assessments to deficiencies cited, the determination of possible abatement actions, and the monitoring of the compliance of recommended abatement actions. Once an appropriate abatement action has been identified and

entered, the local activities would need to be notified in order that they may review the applicability of the abatement action to local deficiencies. Generic abatement actions (appropriate under all conditions) may need to be automatically applied to deficiency records.

#### OHMIS USES COVERED IN THE 'SYSTEM ABATEMENT ACTION' USE MODULE

- o Enter recommended abatement actions.
- o Enter appropriate risk assessment (RAC) code and prioritize actions.
- o Monitor status of abatement actions.
- o Generate status report for all deficiencies.
- o Generate exception report of deficiencies not abated within specific time.
- o Generate installation/DA-wide status of abatement requirements by type and cost.

#### 3.2.3 'System Audit/Evaluation' Use Module

This use module covers the need to be able to generate correlations of planned versus actual performance of Occupational Health, Industrial Hygiene or overall OHMIS activities.

#### 3.2.4 'System Analysis and Report' Use Module

The System Analysis and Report Use Module covers the following System Administrator uses of OHMIS:

- o Generation of ad hoc outputs with the report parameters defined at the time of request. The user may also wish to retain the outputs to allow routine generation at later dates.
- o Generation of correlations of medical surveillance and survey sampling results for selected populations as a part of epidemiological studies.
- o Generation of required Army and DoD occupational health status reports.

### 3.3 OCCUPATIONAL HEALTH USE MODULES

The Occupational Health use modules described below cover the following local uses:

- o Schedule and monitor exam appointments.
- o Record medical exam and medical events (e.g., injuries and illnesses).
- o Generate medical summary data (e.g., diagnosis, treatment).
- o Maintain current and historical employee data pertinent to occupational health.
- o Assist in the analysis of causal data, generate performance reports and define criteria and requirements data.

### 3.3.1 'Medical Exams Scheduling' Use Module

The Medical Exams Scheduling Use Module covers the use by Occupational Health users of resources data on both medical staff and equipment and the recording and generating of appointment schedules. Appointment notices for medical surveillance would need to be generated based on the OH resources available and the medical surveillance requirements attached to each employee. Referral appointment notices to other clinics would also need to be generated based on the employees' medical surveillance requirements. Notices of delinquent exams would need to be automatically generated as the suspense dates arrive.

#### OHMIS USES COVERED IN THE 'MEDICAL EXAMS SCHEDULING' USE MODULE

- o Enter available staffing and equipment resources.
- o Schedule appointments.
- o Enter modifications to schedule.
- o Generate appointment notices to organizational unit, supervisor and employee.
- o Generate delinquency notices to organizational unit, supervisor and employee.

### 3.3.2 'Medical Events Treatment' Use Module

This use module covers the recording of the medical exams and events data collected during pre-employment exams, preplacement exams, medical surveillance exams, injury/illness events, etc. During entry of the medical exams/tests results, abnormal values would need to be flagged. Unusually high/low values or significant shifts from previous values should trigger a request for retesting or analysis.

The user may use OHMIS to output the medical events summary data for up to five preceding years in order to be able to review the overall medical surveillance profile for an individual or group of individuals for trend analysis. Another use of the OHMIS system included in this module would be to generate notices disseminating the results of an employee's exam/event. The generation of activity performance reports using the medical events summary data for a specific time period would be another use in this group of uses.

OHMIS USES COVERED IN THE  
'MEDICAL EVENTS/TREATMENT' USE MODULE

- o Enter medical exams/tests results data.
- o Enter medical events summary data.
- o Generate a medical surveillance profile for a specific time period.
- o Generate notices regarding exam/event results.
- o Generate exception report on missing data (e.g., referral appointment test results).
- o Generate tabulations of services performed for specific time period.

3.3.3 'Employee Characteristics' Use Module

The Employee Characteristics use module covers the use of the OHMIS current and historical data on each employee receiving services from the local Occupational Health activity. This data would need to be recorded and maintained by OHMIS. Each accession of an employee characteristics record should prompt verification and updating of any outdated or missing information.

The OHMIS employee data will be "loaded" from the SIDPERS, JUMPS, SCIPMIS and STARCIPS systems for background and demographic data. Transactions to these external data sources would need to be extracted to maintain current data. Notices to the proponent of these source systems regarding incorrect/outdated information should be transmitted via electronic mail when discrepancies are identified through medical exams/events.

OHMIS USES COVERED IN THE  
'EMPLOYEE CHARACTERISTICS' USE MODULE

- o Enter employee characteristics.
- o Review/verify/update correct employee characteristics data.
- o Generate notices to source systems of incorrect/outdated data through electronic mail system.

- o Generate notice to personnel office of an individual's changed physical profile for required personnel action(s).

### 3.3.4 'OH Analysis and Report' Use Module

This use module covers the local Occupational Health Nurse group of user's needs to define and generate ad hoc reports, generate planned versus actual performance correlations and generate medical surveillance profiles for individuals or groups of individuals with common characteristics or combinations of characteristics for use in trend analysis.

#### OHMIS USES COVERED IN THE 'OH ANALYSIS AND REPORT' USE MODULE

- o Generate user defined reports.
- o Generate correlation of predicted and actual performance of OH activity.
- o Generate medical surveillance profile for an individual or a group of individuals.

### 3.3.5 'OH Controls and Criteria Tables' Use Module

At the local installation level, the Occupational Health user will need to have capabilities similar to those of the System Administrator with regard to defining criteria and requirements. However, the local Occupational Health activity should be allowed to define criteria and performance requirements for its installation and only those criteria and requirements within the responsibility of the Occupational Health activity (with certain exceptions for those Occupational Health activities which are also responsible for Industrial Hygiene uses of OHMIS).

#### OHMIS USES COVERED IN THE 'OH CONTROLS AND CRITERIA TABLES' USE MODULE

- o Enter installation unique allowable limits for clinical tests and exam results.
- o Enter installation unique criteria for medical surveillance requirements.
- o Enter installation unique criteria for job placement requirements.
- o Enter predicted service performance criteria.
- o Generate transaction audit trail.

### 3.4 INDUSTRIAL HYGIENE USE MODULES

The Industrial Hygiene user will need to use OHMIS to record criteria and requirements unique to the installation pertaining to staff and

equipment resources, to specify survey content and frequency, to specify action levels of sampling results, and to generate survey schedules based on these criteria and requirements. This type of user will also wish to generate facility survey profiles for use in the field during surveys and to record the survey data.

Appropriate abatement actions will need to be identified and related to each deficiency cited during a survey. This user will then use OHMIS to monitor these suggested abatement actions for implementation.

#### 3.4.1 'IH Survey Scheduling' Use Module

This use module covers the Industrial Hygiene User Group's use of OHMIS to record staffing resources and to schedule surveys based on these resources and the survey requirements for each facility. Another use in this module is the generation of notices to the organizational units to be surveyed as well as the scheduling for all surveys planned for a specified time period. Automatic monitoring of surveys not completed as suspense dates arrive is another OHMIS use in this module.

##### OHMIS USES COVERED IN THE 'IH SURVEY SCHEDULING' USE MODULE

- o Enter staffing resources.
- o Generate survey schedules.
- o Enter modifications to schedule.
- o Generate survey notices for organizational units.
- o Generate list of delinquent surveys.

#### 3.4.2 'IH Survey' Use Module

This module covers the use of OHMIS to record survey results. The results of a survey will need to be entered and used to update the OHMIS facility data file. This data would need to be used to generate the facility survey profiles employed during the next survey of that facility.

Another use covered by this module is the identification of a list of proposed modifications to an existing facility. This list would allow the Industrial Hygienist to contact the applicable organizational unit to discuss the modifications and any potential health/safety effects which may result. Similarly, this user could use a list of new facilities so that the designs for such facilities may be reviewed for possible health/safety problems. These lists of modified and new facilities would need to be generated via the transactions to the Integrated Facility System (IFS) (an external data source that needs to be incorporated into OHMIS).

A list of hazardous materials issued may also be a use of OHMIS included in this module. The list would be used to monitor which organizational units are procuring hazardous materials in order that the appropriateness of the use of the materials and the necessary controls can be reviewed.

OHMIS USES COVERED IN THE  
'IH SURVEY' USE MODULE

- o Enter survey results.
- o Generate facility survey profiles.
- o Generate exception report of missing data (e.g., sampling results).
- o Generate list of modifications to facilities.
- o Generate list of new facilities.
- o Generate notices to source systems of incorrect/outdated data through electronic mail.
- o Generate list of hazardous materials issued.

3.4.3 'IH Abatement Action' Use Module

This use module covers the use of OHMIS to enter recommended abatement actions for each deficiency cited during a survey. Another use included in this module is to record those abatement actions implemented and to monitor the status of all open deficiencies. Generation of notices of recommended abatement actions to responsible organizational units would be another Industrial Hygienist use of OHMIS covered in this module.

OHMIS USES COVERED IN THE  
'IH ABATEMENT ACTION' USE MODULE

- o Enter recommended abatement action for each deficiency cited with the attendant Risk Assessment (RAC) code.
- o Enter implemented abatement action data.
- o Generate notice to abate deficiencies cited during survey by RAC code prioritization.
- o Generate list of all known deficiencies not abated.
- o Generate list of all known deficiencies for which no abatement action has been identified.
- o Generate status report for all known deficiencies by installation/organization/facility.

#### 3.4.4 'IH Analysis and Report' Use Module

This use module covers the need of the Industrial Hygiene User Group to define and generate ad hoc reports as necessary. OHMIS would also need to be used to generate planned versus actual performance evaluation reports and reports correlating the medical surveillance results with the sampling results for a specified population.

##### OHMIS USES COVERED IN THE 'IH ANALYSIS AND REPORT' USE MODULE

- o Generate use defined reports.
- o Generate correlation of predicted and actual performance of IH activity.
- o Generate correlation of medical profiles and survey profiles.

#### 3.4.5 'IH Controls and Criteria Tables' Use Module

This use module covers the use of OHMIS by the Industrial Hygiene activity to define criteria and requirements unique to the installation, to prescribe allowable limits pertaining to survey sampling results; to specify survey content and frequency; and to monitor the issuing of hazardous materials. Another use included in this module is to enter predicted performance criteria in order that a planned versus actual performance evaluation can be made.

##### OHMIS USES COVERED IN THE 'IH CONTROLS AND CRITERIA TABLES' USE MODULE

- o Enter installation unique allowable limits for survey sampling results.
- o Enter installation unique criteria for survey requirements (e.g., frequency, content).
- o Enter installation unique criteria for requirements to monitor hazardous materials.
- o Enter predicted service performance criteria.
- o Generate transaction audit trail.



SECTION IV - EVALUATION OF OPTIONS FOR SYSTEM DESIGN

#### IV. EVALUATION OF OPTIONS FOR SYSTEM DESIGN

In this Section, the two basic options for designing an occupational health information system for the Department of the Army are evaluated and a recommended approach is given, namely, the development of a new system for OHMIS.

##### 4.1 OPTIONS FOR SYSTEM DESIGN

In general terms, there are two options for the development of a design of an occupational health information system for the Army:

- (1) Identify an existing system, or one currently being developed, and adapt it to the needs of the DA; or,
- (2) Develop a new system specifically designed to meet the needs of the DA.

In order to evaluate these two options, information was collected on a wide array of existing, commercially available systems. FIGURE 4-1 shows the systems reviewed. Not all of the systems shown in FIGURE 4-1 are viable options for OHMIS. Some are not entire systems, but only components of an occupational health information system. Others were found to have characteristics which obviously excluded them from use as an option for the development of OHMIS. Of the systems shown on FIGURE 4-1, 10 systems were found to be sufficiently applicable and complete to warrant further evaluation as an option for the design of OHMIS. These systems were reviewed in detail and their characteristics compared. FIGURE 4-2 shows a summary of this review. As can be seen, the 10 candidate systems (the names of which are shown across the top line of the FIGURE) are summarized and compared based on 9 attributes:

- o Components and modules
- o Hardware and software environment
- o Terminals used
- o Languages used
- o Types of access
- o Data entry features
- o Data output features
- o Security features
- o Cost and services provided

FIGURE 4-1

LIST OF COMMERCIALY AVAILABLE SYSTEMS

| <u>VENDOR</u>  | <u>NAME OF SYSTEM</u>  |
|--|--|
| 1) IBM   | Industrial Medical Support Systems with IBM                    |
| 2) IBM   | IBM - Voluntary Health Screening Examination Program           |
| 3) IBM   | IBM OHMIS Program  |
| 4) IBM   | IBM Computer Oriented Hearing Conservation Program             |
| 5) Tabershaw Occupational Medicine Associates, P.A.        | Tabershaw Occupational Health Management System (TOHMS)        |
| 6) Mediscreen Inc.   | Mediscreen Health Systems                                      |
| 7) SRI International                                       | Center for Occupational and Environmental Safety and Health    |
| 8) JRB Associates, Inc.                                    | Occupational Medical Director Services                         |
| 9) S. C. Johnson & Son, Inc.                               | Occupational Health Information System (OHIS)                  |
| 10) Amode Computer Services Co.                            | Health/Environmental Management System                         |
| 11) Audiometer Corporation of America                      | Besserman Vision Test System                                   |
| 12) Audiometer Corporation of America                      | Besserman Audiometer and Data Management                       |
| 13) HSC Services, Inc.                                     | System - 8   |
| 14) HSC Services, Inc.                                     | System - 7   |
| 15) Mini Computer Systems Inc.                             | Factmatcher  |
| 16) International Medical Services                         | METPATH  |
| 17) Comprehensive Management and Health Care Systems, Inc. | Community Mental Health Center/ Management Information Systems |

FIGURE 4-1

LIST OF COMMERCIALY AVAILABLE SYSTEMS (Cont'd.)

| <u>VENDOR</u>  | <u>NAME OF SYSTEM</u>   |
|--|---|
| 18) Diamond Shamrock                                       | Computerized Occupational Health<br>Environmental Surveillance System<br>(COHESS) |
| 19) Diamond Shamrock                                       | MONITRAC  |
| 20) The Industrial Health and<br>Hygiene Group             | BIOTRAK   |
| 21) Information Sciences Inc.                              | InSci Human Resources System  |
| 22) Life Extension Institute<br>(Control Data Corporation) | The Occupational Health Medical<br>Surveillance System                            |
| 23) Flow General Inc.                                      | Flow GEMINI (Flow General's Medical<br>Information Needs for Industry)            |
| 24) TRC Environmental<br>Consultants, Inc.                 | Exposure Record System (ERS)  |
| 25) Creative Socio-Medics Corp.                            | Occupational Health Information<br>System   |
| 26) Creative Socio-Medics Corp.                            | Creative Employee Medical Informa-<br>tion System                                 |
| 27) Comprehensive Health<br>Services, Inc.                 | Rapid Access Medical System for<br>Industry (RAMS/I)                              |
| 28) MTSC   | OMAR  |
| 29) Celanese Corporation                                   | Celanese Health Surveillance<br>System  |
| 30) Mitre Corporation                                      | COSTAR  |

FIGURE 4-2

SUMMARY OF REVIEW OF COMMERCIALY AVAILABLE SYSTEMS

|   | Candidate System #1   | Candidate System #2  | Candidate System #3  | Candidate System #4   | Candidate System #5         |
|---|---|--|--|---|-----------------------------|
| Occupational Health Surveillance System (OHSS)  | Occupational Health Surveillance System (OHSS)  | Occupational Health Information System (OHIS)                                    | Computerized Occupational Health/Environmental Surveillance System (COHESS)  | Flow Gemini   | OSHA - Health Safety System |
| Medical Services Module<br>Claims Processing Module<br>Stability Module<br>Industrial Hygiene Module<br>Radiometry Module<br>Accident/Safety Module | Personnel Module<br>Medical Module<br>Industrial Hygiene and Toxicology Module<br>Interactive Medical Records Management System (opt.)<br>Clinic Management and Scheduling (opt.) | People Places Things   | Employee Partition<br>Workplace Partition<br>Environmental Agent Partition<br>Scheduling<br>Chemical Reference<br>Report Generator<br>Query Language<br>Backup Statistical Package | Occupational History<br>Physical Examination<br>Injury/Illness<br>Clinic Visit<br>Environmental Exposure  |                             |
| IBM or equivalent<br>IBM Main frame can be used with IMS DBMS<br>also planned for CDC Cybernet on IPT-2 DBMS  | DEC PDP 11/34 and VAX<br>Harris<br>Data General<br>Tandem<br>Prime<br>(any hardware supporting ANSI standard MUMPS)   | IBM Main frame, OS/VS<br>IMS DBMS<br>Datapoint 6600 mini-computer (120K-60MB-DS) | DEC VAX 11/780, 750 or 730<br>Flow General DBMS  | IBM 360, 370, or 4300 Main frame<br>OS, DOS, VS<br>Requires 150K core,<br>3 tape or disk drives,<br>2 disks, 1 card reader<br>InSci Data Analyzer |                             |
| Keyboards<br>Printers<br>Planned: CRT terminals and scanners for machine readable forms   | CRT terminals or printers   | CRT terminals Printers   | CRT terminals Printers   | Keyboard Printers   |                             |
| On-line and batch<br>Assembler Language   | ANSI Standard MUMPS   | CUBOL and Dataspace  | FORTAN   | COBOL   |                             |
| On-line<br>Batch  | On-line   | On-line to minicomputer<br>Batch to main frame                                   | On-line  | Batch   |                             |

FIGURE 4-2 (Cont'd.)

|                      | Candidate System #1  | Candidate System #2   | Candidate System #3   | Candidate System #4   | Candidate System #5                  |
|----------------------|--|---|---|---|--------------------------------------|
| Data entry features  | Key entry for batch processing<br>Planned: CRI screen-driven entry with edit checks  | Menu-driven dialogue<br>Screen controlled data entry<br>Microprocessor interface for laboratory data<br>On-line editing<br>On-line help<br>User designed input formats<br>Voice recognition<br>Touch sense terminals for optional Medical Records Management and Scheduling systems | Menu-driven input<br>On-line editing<br>Tape to tape  | Menu-driven dialogue<br>Prompted and unprompted entry<br>On-line help<br>Multiple range user defined edits<br>User-specified verification mode<br>Program interface for automatic exchange of data with other computer systems or devices   | Turnaround forms<br>Keypunch entry   |
| Data output features | User-tailored outputs<br>Canned reports (e.g., physical examination summary)<br>Trend reports on physical findings<br>Statistical reports via SPSS<br>Scheduling reports | Canned reports<br>On-line query and output<br>Batch printed outputs<br>Ad hoc reports via report generator<br>Plotting capabilities<br>Narrative reports<br>Statistical reports via SPSS on DEC VAX and Harris hardware   | Canned reports<br>Screen-driven requests for People and Places outputs<br>Computer output microfiche or hard copy for Things Module | Canned reports (can be user modified)<br>Report generator<br>Query language   | Turnaround forms<br>Ad hoc retrieval |
| Security features    | Password access<br>Client security options<br>Back up tapes held in protective vault<br>All Federal security requirements met  | Password access<br>User I.D.'s<br>Tied terminal feature<br>Restricted access to functions<br>Restricted access for programming  | Password access<br>Scrambled Social Security numbers  | Five password-controlled functional access levels defined for each report<br>User-defined data access profiles for individual users<br>Separate disk drives for data base and transactions<br>Vault storage of daily transaction tapes<br>Terminal restrictions under VAX operating system<br>Audit trail for segment | undefined                            |

FIGURE 4-2 (Cont'd.)

| Candidate System #1   | Candidate System #2   | Candidate System #3 | Candidate System #4 | Candidate System #5 |        |             |        |             |        |             |        |               |        |         |        |  |   |                  |                |         |       |           |                                   |             |                                     |             |                                     |             |                                     |             |                                      |       |  |  |
|---|---|---------------------|---------------------|---------------------|--------|-------------|--------|-------------|--------|-------------|--------|---------------|--------|---------|--------|--|---|------------------|----------------|---------|-------|-----------|-----------------------------------|-------------|-------------------------------------|-------------|-------------------------------------|-------------|-------------------------------------|-------------|--------------------------------------|-------|--|--|
| <p><b>Software costs</b></p> <p><b>Stand Alone purchase options:</b></p> <p>1) License fee for use of \$2K plus usage fee of \$1 per employee processed</p> <p>2) License fee of \$50K plus usage fee of \$2 per employee processed</p> <p>3) License fee of \$25K plus usage fee of \$5 per employee</p> <p>All options have a one time \$5K installation fee.</p> <p>Software maintenance contract optional at \$500/month.</p> <p><b>QDC Processing:</b></p> <p>\$20 per employee processed. Cost covers the 400 QDC defined substances for correlation charge for the addition of chemicals to the logic.</p> <p><b>Services included:</b></p> <p>Acceptance test and user documentation.</p> | <p><b>License fee is a function of the number of employees served:</b></p> <table><tr><th>No. of Employees</th><th>Fee</th></tr><tr><td>0 - 999</td><td>\$ 75K</td></tr><tr><td>1000 - 2499</td><td>\$ 85K</td></tr><tr><td>2500 - 4999</td><td>\$100K</td></tr><tr><td>5000 - 9999</td><td>\$115K</td></tr><tr><td>10000 - 29999</td><td>\$130K</td></tr><tr><td>30000 +</td><td>\$150K</td></tr></table> <p>Additional license fee of \$25K for each of the optional modules.</p> <p>Optional software maintenance contract at \$7500/year includes enhancements and problem resolutions.</p> <p><b>Timesharing fee on a rate per month per access basis, with the access a function of the size from \$2K to \$3K per month.</b></p> <p><b>Services included:</b></p> <p>Installation, Training and Support.</p> | No. of Employees    | Fee                 | 0 - 999             | \$ 75K | 1000 - 2499 | \$ 85K | 2500 - 4999 | \$100K | 5000 - 9999 | \$115K | 10000 - 29999 | \$130K | 30000 + | \$150K | <p><b>Stand Alone purchase:</b></p> <p>\$325K for permanent license with all source code and documentation.</p> <p><b>Lease/Purchase:</b></p> <p>Lease price \$4,033/mo. on a 2-year basis.</p> <p>\$20K fee for training.</p> <p>\$40K credit toward purchase of stand alone</p> <p><b>Service included:</b></p> <p>Three phases of training and acceptance test.</p> | <p><b>System license option:</b></p> <p>\$200K</p> <p><b>Timesharing option:</b></p> <p>Monthly charge based on the number of employee records:</p> <table><tr><th>No. of Employees</th><th>Monthly Charge</th></tr><tr><td>0 - 249</td><td>\$750</td></tr><tr><td>250 - 999</td><td>\$750+ \$1. per employee over 250</td></tr><tr><td>1000 - 2999</td><td>\$1500+\$.60 per employee over 1000</td></tr><tr><td>3000 - 4999</td><td>\$2700+\$.40 per employee over 3000</td></tr><tr><td>5000 - 9999</td><td>\$3500+\$.30 per employee over 5000</td></tr><tr><td>10000-29999</td><td>\$5000+\$.20 per employee over 10000</td></tr><tr><td>30000</td><td></td></tr></table> <p><b>Services included:</b></p> <p>System license option price includes routine system maintenance for first year. Two weeks training.</p> <p><b>Timesharing option price includes preparation of data descriptions for basic system, two weeks training, user documentation and telephone consultation as needed.</b></p> | No. of Employees | Monthly Charge | 0 - 249 | \$750 | 250 - 999 | \$750+ \$1. per employee over 250 | 1000 - 2999 | \$1500+\$.60 per employee over 1000 | 3000 - 4999 | \$2700+\$.40 per employee over 3000 | 5000 - 9999 | \$3500+\$.30 per employee over 5000 | 10000-29999 | \$5000+\$.20 per employee over 10000 | 30000 |  | <p><b>Stand Alone purchase:</b></p> <p>\$157K with Data Analyzer, \$130K without. Additional site add \$53K for first, \$26.5K for second, \$11K for third and beyond.</p> <p><b>Services included:</b></p> <p>Fifty days of support on installation and training.</p> |
| No. of Employees  | Fee   |                     |                     |                     |        |             |        |             |        |             |        |               |        |         |        |  |   |                  |                |         |       |           |                                   |             |                                     |             |                                     |             |                                     |             |                                      |       |  |  |
| 0 - 999   | \$ 75K  |                     |                     |                     |        |             |        |             |        |             |        |               |        |         |        |  |   |                  |                |         |       |           |                                   |             |                                     |             |                                     |             |                                     |             |                                      |       |  |  |
| 1000 - 2499   | \$ 85K  |                     |                     |                     |        |             |        |             |        |             |        |               |        |         |        |  |   |                  |                |         |       |           |                                   |             |                                     |             |                                     |             |                                     |             |                                      |       |  |  |
| 2500 - 4999   | \$100K  |                     |                     |                     |        |             |        |             |        |             |        |               |        |         |        |  |   |                  |                |         |       |           |                                   |             |                                     |             |                                     |             |                                     |             |                                      |       |  |  |
| 5000 - 9999   | \$115K  |                     |                     |                     |        |             |        |             |        |             |        |               |        |         |        |  |   |                  |                |         |       |           |                                   |             |                                     |             |                                     |             |                                     |             |                                      |       |  |  |
| 10000 - 29999   | \$130K  |                     |                     |                     |        |             |        |             |        |             |        |               |        |         |        |  |   |                  |                |         |       |           |                                   |             |                                     |             |                                     |             |                                     |             |                                      |       |  |  |
| 30000 +   | \$150K  |                     |                     |                     |        |             |        |             |        |             |        |               |        |         |        |  |   |                  |                |         |       |           |                                   |             |                                     |             |                                     |             |                                     |             |                                      |       |  |  |
| No. of Employees  | Monthly Charge  |                     |                     |                     |        |             |        |             |        |             |        |               |        |         |        |  |   |                  |                |         |       |           |                                   |             |                                     |             |                                     |             |                                     |             |                                      |       |  |  |
| 0 - 249   | \$750   |                     |                     |                     |        |             |        |             |        |             |        |               |        |         |        |  |   |                  |                |         |       |           |                                   |             |                                     |             |                                     |             |                                     |             |                                      |       |  |  |
| 250 - 999   | \$750+ \$1. per employee over 250   |                     |                     |                     |        |             |        |             |        |             |        |               |        |         |        |  |   |                  |                |         |       |           |                                   |             |                                     |             |                                     |             |                                     |             |                                      |       |  |  |
| 1000 - 2999   | \$1500+\$.60 per employee over 1000   |                     |                     |                     |        |             |        |             |        |             |        |               |        |         |        |  |   |                  |                |         |       |           |                                   |             |                                     |             |                                     |             |                                     |             |                                      |       |  |  |
| 3000 - 4999   | \$2700+\$.40 per employee over 3000   |                     |                     |                     |        |             |        |             |        |             |        |               |        |         |        |  |   |                  |                |         |       |           |                                   |             |                                     |             |                                     |             |                                     |             |                                      |       |  |  |
| 5000 - 9999   | \$3500+\$.30 per employee over 5000   |                     |                     |                     |        |             |        |             |        |             |        |               |        |         |        |  |   |                  |                |         |       |           |                                   |             |                                     |             |                                     |             |                                     |             |                                      |       |  |  |
| 10000-29999   | \$5000+\$.20 per employee over 10000  |                     |                     |                     |        |             |        |             |        |             |        |               |        |         |        |  |   |                  |                |         |       |           |                                   |             |                                     |             |                                     |             |                                     |             |                                      |       |  |  |
| 30000   |   |                     |                     |                     |        |             |        |             |        |             |        |               |        |         |        |  |   |                  |                |         |       |           |                                   |             |                                     |             |                                     |             |                                     |             |                                      |       |  |  |

FIGURE 4-2 (Cont'd.)

| Candidate System #6   | Candidate System #7   | Candidate System #8  | Candidate System #9  | Candidate System #10   |
|---|---|--|--|--|
| Occupational Medical Automated Record Keeping System (OMAR)   | Health/Environment Management System HEMS   | Tabershaw Occupational Health Management System (TOHMS)  | Computer STORed Ambulatory Record (COSTAR)   | Environmental Chemical Occupational Evaluation System (ECHOES)   |
| <ul style="list-style-type: none"> <li>Medical Module</li> <li>Audiometric Testing Module</li> <li>Industrial Hygiene Hazard Information Module</li> <li>Risk Management Module</li> <li>Environmental Health News</li> </ul> | <ul style="list-style-type: none"> <li>Personnel Medical</li> <li>Industrial Hygiene</li> <li>Toxicology</li> <li>Safety</li> </ul> | <ul style="list-style-type: none"> <li>Clinical Management System</li> <li>Industrial Hygiene</li> <li>Toxicology</li> <li>Epidemiology Data Management</li> <li>Health Care Monitoring</li> <li>Environmental Monitoring</li> <li>Data Management</li> <li>Safety</li> <li>Regulatory/Legal Report Generator</li> </ul> | <ul style="list-style-type: none"> <li>Registration</li> <li>Scheduling</li> <li>Medical Records</li> <li>Accounts Receivable/Billing</li> <li>Management Reporting</li> <li>System Maintenance</li> </ul> | <ul style="list-style-type: none"> <li>Chemical Data Base</li> <li>Employee Data Base</li> <li>Industrial Medical Support</li> <li>Hearing Conservation</li> <li>Voluntary Health Screening</li> </ul> |
| IBM 370/158, VM/CMS<br>MISC PL1 DBMS  | IBM 370 or newer main frame, OS/MT, CICS<br>Mark 4 Batch Query Language   | IBM System 34<br>IBM System 38<br>System 38 Relational DBMS  | DEC<br>Harris<br>Data General<br>Tandem<br>Prime<br>(any hardware supporting ANSI Standard MUMPS)<br>(Min. Configuration PDP 11/34, 67 MB disk storage)  | IBM 370 or newer mainframe   |



FIGURE 4-2 (Cont'd.)

|                      | Candidate System #6  | Candidate System #7   | Candidate System #8   | Candidate System #9  | Candidate System #10                                      |
|----------------------|--|---|---|--|---|
| Terminals used       | Any Terminals or Printers  | OPSCAN 17 Optical Mark Readers<br>Keyboard Terminals  | IBM 5250 series CRT Terminals<br>IBM 3262 Printers  | CRT Terminals or Printers  | CRT Terminals   |
| Languages Used       | PL1<br>APL<br>COBOL  | BAL and COBOL   | COBOL for System 38<br>COBOL and FORTRAN for System 34  | ANSI Standard MUMPS  | PL1<br>APL  |
| Type of access       | un-line or Batch   | On-line input of Medical data<br>Batch entry and processing   | On-line   | On-line  | Batch<br>On-line retrieval of selected data               |
| Data entry           | Tape entry for batch processing<br>Un-line entry: Menu and Screen driven Input<br>On-line help<br>On-line verification/editing<br>Customized screen Interfaces with microprocessor testing equipment | Mark sense form entry<br>On-line editing of medical data  | Menu driven dialogue<br>Screen oriented record at the time system Question and answer capacity<br>Batch control mechanism<br>On-line editing<br>Automatic scheduling and protocol generation for data entry | User-designed forms and medical record format  | Mark sense form entry                                     |
| Data output Features | Canned reports<br>Ad hoc reports<br>Statistical and graphic analysis capabilities  | Canned reports<br>Mark 4 Batch Query Language   | Query output<br>Batch printed outputs<br>Canned reports<br>Special on-line and batch table generation   | Canned reports<br>Frequency distributions<br>Special reports-user-specified selection criteria | Canned reports  |
| Security Features    | Layared access restrictions<br>Multiple passwords<br>User I.D.'s<br>Patient numbers needed for access to individual records  | Password access<br>Scrambled Social Security Numbers<br>Names of individuals not on master records in system<br>Tied terminals for medical data | Password access<br>User I.D.'s<br>Function access restrictive<br>Access protected at file level on System 38<br>Each user can have segregated files and libraries that can be integrated for analyses       | Password access controlled by System Manager   | Four levels of on-line security for hardware and software |

FIGURE 4-2 (Cont'd.)

|                             | Candidate System #6   | Candidate System #7   | Candidate System #8   | Candidate System #9                             | Candidate System #10                  |
|-----------------------------|---|---|---|---|---------------------------------------|
| Costs and Services Provided | <p>Stand Alone Purchase: \$15K to \$200K. Cost depends on the modules purchased &amp; installation fee.</p> <p>MISC processing: \$12 to \$20 per employee per year. (Cost is dependent on size of client, volume of data and size of records.)</p> <p>Client processing via RCS terminals: \$6 to \$12 per employee per year.</p> <p>Services included: Training.</p> | <p>Stand Alone Purchase: \$200K</p> <p>Services included: Installation and Training</p> | <p>Stand Alone Purchase: System 38 - \$250K<br/>System 34 - negotiable</p> <p>License for System 38 use \$150K plus \$400/mo. for support after first year.</p> <p>Services included: Installation and testing. Training is negotiable.</p> | <p>No charge for software and documentation</p> | <p>Not yet commercially available</p> |

## 4.2 EVALUATION OF OPTIONS

TASK C of the Contract under which this report was developed (APPENDIX A) required evaluating the options for the development of OHMIS and selecting the "best" system. The evaluation of the existing systems to identify the best one follows naturally from the comparison of system characteristics described above and shown in FIGURE 4-2. However, the comparison of the best existing systems, which have actual limiting characteristics, with a new system that has only hypothetical characteristics and can be changed to fit the evaluation, is theoretically more difficult to do systematically. By definition, there is always a "best" system among the existing options. However, when compared with a new system that has not yet been developed and, therefore, is infinitely flexible, the new system can always be defined so that it is the "best" system, regardless of what system to which it is compared. For a similar reason, it is not possible to evaluate a new, undeveloped system based on a set of evaluation criteria because in developing the description of the proposed new system, provisions for meeting any evaluation criteria (except those not possible under any system) would necessarily be incorporated into the proposed system design. Moreover, because of the resources required to develop a system, it was not rational to approach the evaluation problem by proceeding with the development of a new system that would later be compared with the existing system; the new system design could only be developed based on the assumption that the second of the above two options, that of using a new system, was chosen as the option for the OHMIS system design. Finally, there was the additional problem in evaluating existing systems that arose from a lack of information about some of the existing systems for the characteristics that are important to the DA. For these reasons, the following approach was taken to evaluation of the system design options:

- (1) Identify a set of system evaluation criteria.
- (2) Compare the existing systems (but not the new system) to the evaluation criteria developed in (1).
- (3) Identify the generic advantages/disadvantages of using an existing system compared to developing a new system. This is necessary in order to enable the comparison of an actual existing system with a hypothetical new system.
- (4) Based on the generic criteria identified in (3), identify the criteria that will rule out the option of developing a new system, thus, enabling either: (1) the selection of the best existing system (if the option of a new system is ruled out); or (2) the selection of the new system option (if this option cannot be ruled out).

### 4.2.1 Evaluation Criteria

The following are the 6 criteria used to evaluate the existing commercial systems as options for the design of OHMIS:

- 1) Cost of the system. A specification of the Contract under which this project was conducted was that the system chosen must be within the constraints of a Class IV system. That is, the system must cost less than \$3 million.
- 2) Compatibility of the system to reside on VIABLE hardware. The selection of the hardware (ADPE) for OHMIS was constrained by the storage and processing requirements of an Army-wide system as well as the need to stay within the parameters of a Class IV system. The review of potentially available ADPE at the five surveyed installations, HSC and USAEHA did not reveal an ADPE system which was: a) generically available at all installations, b) capable of handling the large storage and processing requirements of OHMIS, and c) would not require extensive telecommunications facilities to link with an acceptable mainframe.

There is, however, currently under development a system which meets all these needs, namely, the VIABLE system described in Section 1.1.1. This extensive DBM system will be installed at most Army installations to meet the "Base Operations" functions of the Army. While much of the VIABLE system information is still closely held, discussions with the VIABLE project team revealed that VIABLE was capable of meeting all OHMIS needs and that OHMIS was an acceptable candidate system for VIABLE. The use of VIABLE would permit development of a full-scale OHMIS with the need to only purchase peripheral equipment such as terminals, modems and printers. This makes VIABLE the only system capable of handling OHMIS within the Class IV system size constraint. Moreover, as described in Section 1.1.1, VIABLE has many features that make it an ideal host system.

In the Final Report Criteria Meeting held on September 7, 1982, the VIABLE alternative was discussed and a decision made to proceed on the assumption that VIABLE would be the ADPE used.

The decision to use VIABLE as the host system for OHMIS meant that one of the system evaluation criteria was that the system had to be capable of residing on VIABLE.

- 3) On-line processing and retrieval of data. A frequently repeated complaint from almost all potential users of OHMIS was the current inability for the user to retrieve data from the DA's existing occupational health data bases (i.e., LOHHI and HEARS). Moreover, the need for improved communication between the various users of OHMIS was one of the most frequently cited needs for OHMIS. In addition, the quality control requirements of OHMIS, especially for entering employee data or data in which an employee is the unit being described (e.g., medical events data) are such that interactive entry is required. It is not acceptable for users of OHMIS to enter data on employees without

knowing that they have identified the appropriate employee. Because of these reasons, it was determined that the design of OHMIS should be such that it would support an on-line user query system for data retrieval and an interactive checking and editing system for data entry.

4) Easy interface with external sources of data.

Traditionally, there are 5 major types of data in an occupational health information system: (1) data on employees; (2) data on the workplace; (3) data on hazardous items to which employees are exposed; (4) data on medical events (both treatments and injuries/illnesses of employees); and, (5) data on corrective actions for hazardous exposures. With the exception of the fifth type of data, substantial portions of all of these data types are already being collected within the DA for other purposes. Moreover, much of the data on employees, facilities and supplies (the first 3 types of data) and the inpatient medical events data (data type 4) are already being collected in computerized form. Because of the large number of units in the DA (i.e., the large number of employees, facilities and supplies and the corresponding large number of medical events and corrective events), it was deemed to be totally unacceptable to design an OHMIS system that would require manual re-entry of these substantial portions of the potential OHMIS data base that are already computerized. Specifically, the recommended system must be such that it cannot only use an existing source of data as the initial OHMIS data base (e.g., the data base on employees currently employed by the DA), but also must be such that it can be updated routinely using data from existing data sources. Any other approach would make the OHMIS system duplicative and economically impractical to operate and, therefore, difficult to justify. Accordingly, the capability of interfacing with existing DA data bases (referred to as external data sources) and routinely receiving new input to the system data from these external data bases was selected as an evaluation criteria.

5) High degree of flexibility and ready adaptation to changes in DA needs. Almost all aspects of the DA occupational health program are experiencing a great amount of change. There are changes in requirements, both regulatory requirements and user needs; changes in the availability of resources; changes in the understanding of what constitutes hazardous substances and the occupational relatedness of diseases; etc. There is also considerable local variation in needs, resources and capabilities. Because of these facts, the OHMIS system must be capable of extensive and continuing modifications. These modifications must be possible without extensive additional programming and without degrading the previously generated OHMIS data base.

- 6) Ability to enhance the program management, audit and quality assurance functions of the Army's occupational health program. As described in Section V, an all pervasive characteristic of the occupational health program components identified during the generation of the OHMIS use modules (Section III) is the need to identify, trigger, monitor and adapt to changes in requirements and the need to assure a high degree of accuracy and comprehensiveness in complying with requirements. For example, the occupational health program must be able to identify those persons that need a particular type of medical examination; trigger such examinations at the appropriate intervals; monitor that such examinations are conducted; identify changes in either the requirements for medical examinations or the persons to whom they apply, as well as identifying changes in the operating methods (e.g., job assignments) that affect the compliance with the requirements; and, assure that all of the above 4 functions are accurate and comprehensive, i.e., that all employees needing examinations are identified, that all examinations are conducted and that the examinations are conducted in complete accordance with the requirements. This same set of functional requirements applies to most of the other uses of an occupational health program (as described in the use modules). Therefore, to meet the functional requirements of a DA occupational health program, the information system should provide support for the execution of these requirement monitoring and assurance functions.

The first 3 of the above criteria were given the highest weight. This is partly because these are objective "Yes/No" criteria, while the last 3 criteria are a matter of degree. Thus, the systems can only be generally evaluated by these last 3 criteria.

#### 4.2.2 Evaluation of Existing Systems Using the Evaluation Criteria

The 10 systems reviewed in FIGURE 4-2 were evaluated in terms of the above 6 evaluation criteria. None of the systems met all 6 criteria; in fact, none met even the first 3 minimum criteria:

- o Cost of the system. Candidate systems 1, 2, 3, 4, 5, 6, 7 and 8 would all exceed the cost constraints of a Class IV system.
- o Compatible with VIABLE. Candidate systems 2, 4 and 9 are incompatible with VIABLE hardware.
- o On-line entry and retrieval. Candidate systems 1, 3, 5, 7 and 10 are exclusively or primarily batch processing and retrieval systems.
- o Interface with external data sources. None of the descriptions of the existing commercial systems specifically stated that the system was designed to be compatible with initial loading or ongoing input from existing data bases.

- o Flexibility and adaptability to continuing changes. None of the system descriptions indicated that any system was specifically designed to meet this criteria. However, some of the systems did provide for easy changes in the operating values of the system. For example, the ability to change the values in the unacceptable values tables was included in some systems.
- o Requirements monitoring and assurance. None of the system descriptions specifically address this concept. Although several of the systems were designed to identify the entry of values that were above or below an acceptable value from a table that could be generated by the user, in no case was this process directly linked to triggering a requirement (i.e., identifying the specific actions that should be taken whenever the acceptable value is entered and scheduling these actions) or to monitoring the completion of the required actions (e.g., through a reminder notice or status report system).

In summary, the review of existing commercial systems for the evaluation criteria did not result in the identification of a system that stood out as being obviously well-suited for OHMIS. No system was found to be very close to meeting the evaluation criteria, nor was a system found to be capable of meeting almost all of the user needs specified for OHMIS.

#### 4.2.3 Comparison of Generic Advantages/Disadvantages of an Existing System Versus a New System

Because none of the existing commercial systems stood out as being obviously well suited for OHMIS, the concept of developing a new system was examined. For the reasons mentioned above, it was not possible to evaluate the new system in the same way as existing systems. Instead, the approach was to examine and compare the generic advantages and disadvantages of using any existing system versus any new system. The aim was to identify criteria that would enable either one of these two major options to be ruled out. If this can be done, then the choice of which system to select (i.e., either the best of the existing systems or the new system) would be clear.

Viewing the two options (existing system versus new system) in this generic way, it can be seen that the major outstanding advantage of any new system is that it can be specifically designed to meet the needs of the user. In the case of OHMIS, the development of a new system would mean that it could be designed to be compatible with VIABLE, be interactive, interface with all existing external data sources, be flexible, and provide for requirements monitoring and assurance. In addition, a newly developed OHMIS can be designed to perform each of the use modules identified in Section III. Regardless of the features of any existing system, a system would never be found to be more directly applicable to the user needs and functional requirements of a system, or more compatible with existing data sources, procedures and programs than a new system specifically

designed to have these features. In summary, the outstanding advantage of any new system is that the designer can design the system to "get exactly what he/she wants."

The above generic advantage of any new system is very significant and may, at first, appear to be inherently overriding. Thinking in terms of a "rule out" type of criteria, one might ask: "If a new system can result in an OHMIS with the exact features desired, what would be the reason why the new system option would not be chosen?" The answer is, of course, costs and uncertainty. The one limitation on the outstanding advantage of a new system is that the new system can be designed to be an exact match to the user's needs, provided costs are not a consideration. More specifically, the two generic disadvantages of any new system are: (1) the user must pay the costs to develop the system and these costs may be substantial, while there are no developmental costs for an existing system; and, (2) the uncertainty of the success of a new system as compared to the known degree of success of any existing system. This second disadvantage is related to the first in that the developmental costs of a new system that are not included in the implementation of an existing system, can be considered to include those costs to test and modify the new system to the point where it is operating successfully.

The combination of the above identified advantages/disadvantages of a new system yields the following conclusion about which option for the development for OHMIS should be chosen. Because the new system option provides for a system that exactly meets the needs for OHMIS, the new system option should be selected, unless it can be shown that the extra costs to develop the new system are either (1) beyond the limits allowed (i.e., beyond the constraints of a Class IV system) or (2) too extensive compared to the extra user needs provided by the new system as compared to an existing system. Put in the opposite way, it would clearly be better to use an existing system if it could be found that it met all or nearly all of the user needs and evaluation criteria and was under the allowable costs, because the uncertainty of undertaking a new system is removed.

As indicated above, only two of the existing systems were found to be under the allowable costs and none of the systems were found to meet all of the evaluation criteria. Moreover, an examination of the costs for the recommended system design for the new OHMIS (given in Section VIII) indicates that the costs are within the constraints of a Class IV system. Therefore, a new system cannot be ruled out and the conclusion is that a new system is the "best" system for the Department of the Army's occupational health information system.

#### RECOMMENDED SYSTEM DESIGN

The tentative decision that a new system is the best approach for the design of a DA occupational health information system led to development of a recommended system design for the new OHMIS system. This recommended system design is described in the following 4 sections of this report. First, an overview of the new system is given (Part 1). This is followed by the detailed functional requirements



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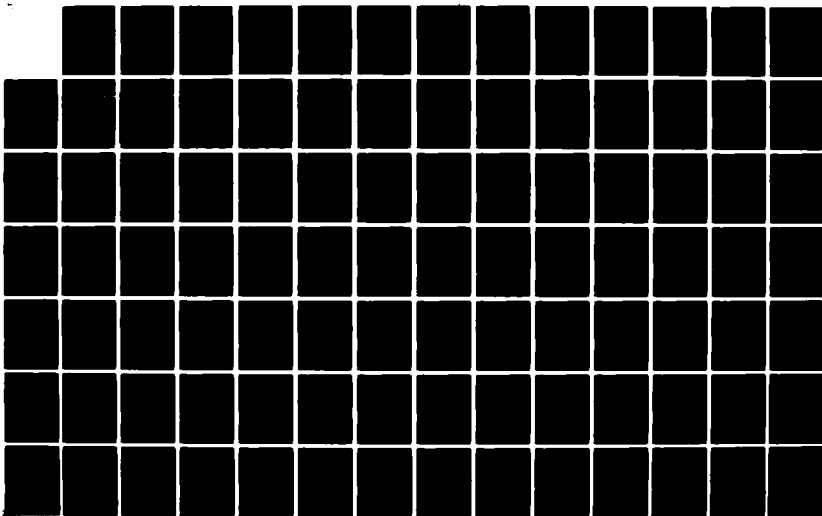
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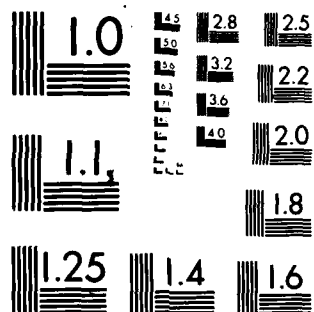
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flows for the 11 core data processing functions of the recommended OHMIS system design (Part 2). Next, the system specifications for the new recommended system are reviewed (Part 3). Finally, the expected costs and impact of the new system are detailed (Part 4).

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## V. RECOMMENDED SYSTEM DESIGN - PART 1

### Summary

This Section of the report is the first of the 4 sections describing the recommended system design for OHMIS. In this Section, a summary of the recommended system design is given.

#### 5.1 DESIGN CRITERIA AND APPROACH

Following the review of existing occupational health information systems in which it was tentatively decided that the best option for the design of OHMIS would be to develop a new system description, a description of what the exact nature of the new system should be was begun. In developing this recommended system design, 2 major design criteria were followed:

- 1) The recommended system design should meet all of the 6 evaluation criteria used in the evaluation of existing systems, namely, the system should be:
  - Within the constraints of Class IV system
  - Capable of residing on VIABLE
  - Interactive
  - Capable of interfacing with existing external data sources
  - Flexible and easily changed
  - Capable of requirements monitoring and assurance
- 2) The system should enable the performance of each of the uses of OHMIS described in the use modules given in Section III, namely, the system should provide a means for:
  - Identifying the DA requirements and criteria for an occupational health program and incorporating these requirements/criteria into the information system's decision making functions
  - Scheduling and conducting medical exams and industrial hygiene surveys in accordance with DA requirements
  - Identifying the abatement actions and follow-up medical services that should arise from the result of the industrial hygiene surveys and medical examinations
  - Monitoring the abatement actions and medical services to insure that they are provided in accordance with DA occupational health program policies and procedures

- Generating summary reports of all data entered into OHMIS, including status reports on compliance with the occupational health program requirements

Because of the specifications given in the contract, the approach taken toward developing the recommended system design with the above features was to provide a design in sufficient detail that it is suitable for programming. For this reason, the emphasis in the system design description given in this report is on the data processing functions of the occupational health information system, rather than on the programmatic functions associated with operating an occupational health program. For example, the scheduling of medical exams can be described in terms of:

- o The input, processing and output of the specific data elements needed to schedule a medical examination, i.e., the data processing functions; or,
- o How the programmatic decisions associated with scheduling medical exams are made, i.e., the programmatic functions. Such programmatic decisions would include: Who should receive the examination; how often should the examination be conducted; what should be the contents of the examination; what should be the response to the results of the examination; who was responsible for insuring that these decisions are made and followed; and how is the responsibility for the decision-making process structured, e.g., how is authority designated.

Both the data processing and the programmatic functions are needed to operate an occupational health program and to supply the actual content of an occupational health information system. However, this report is confined to the data processing functions. This approach was taken primarily because of the constraint of providing a system description in sufficient detail for programming, but also because:

- o Many of the programmatic functions are based on policy decisions about the operation of the DA occupational health program. Although many recommendations for the content of these policies were obtained during the study conducted in preparation for this report, the final decision about program operation policy decisions are not within the scope of this report.
- o It was desired to develop an occupational health information system design that was to the greatest degree possible independent of the specific programmatic policy decisions of the DA occupational health program. That is, OHMIS should be capable of providing the data processing support for any of the occupational health program policies specified by the DA, rather than being designed to support a specific set of policy decisions. This approach was taken in order to make the information system highly flexible and adaptable to change and to ensure that the

system was applicable to users at a wide variety of management levels at which this specific program policies may vary. For example, it was not deemed desirable to build into the information system any particular set of decisions about who should receive medical examinations, but rather to design a system that would perform the data processing functions for executing any decision about examination scheduling.

This approach means that the recommended system design is necessarily generic in nature. For example, no specific input forms are described here; rather, the types of inputs needed for the system's operation and the data processing functions for any OHMIS form are described.

This approach also means that the development of the OHMIS recommended system design was centered primarily around identifying the types of decisions for which the OHMIS computer program should be capable of providing information support.

Another closely related factor affecting the approach used to design OHMIS was that it should be designed to be truly a management tool. The overall objective in the design of OHMIS is to develop a system that is more than merely a repository of the 5 types of data in an occupational health system (employees, workplaces, hazards, medical events and corrective action). While the storage of these data elements is a requirement fulfilled by OHMIS and the analysis of trends in these data elements a potential use for OHMIS, it was desired to design OHMIS to also have a more immediate, practical use that was directly linked to improving the occupational health of DA employees. Specifically, OHMIS has been designed to provide support to the day-to-day decision-making processes involved in the operation of an occupational health program. Put another way, the OHMIS recommended system design described in this report covers the data processing functions needed to support the programmatic functions of an occupational health program.

As will be seen, the recommended system design of OHMIS is such that the specific programmatic policy decisions (requirements) about the operation of the DA occupational health program are first entered into the OHMIS data base. The generic nature of the design of OHMIS is such that regardless of what the specific requirements are entered, OHMIS will identify when the requirement is applicable, identify the actions that need to be taken to comply with the requirement and schedule and monitor the tasks needed to execute these actions. For this reason, before OHMIS can become operational, an initial set of occupational health program requirements must be "loaded" into the OHMIS data base. Although many of these requirements are known, large gaps in the written prescriptions provided for the operating procedures of the DA occupational health program were found during the installation visits made as a part of the study under which OHMIS was developed. It was also found that there is an extremely wide variation in the interpretation and implementation of those

occupational health program policy decisions that are available in written form.

In light of the current absence of the information system needed to support the promulgation and implementation of occupational health program requirements, the current gaps in the Department of the Army's occupational health program requirements should not be considered to be surprising. The institution of OHMIS, as designed in the recommended system description, will greatly facilitate the execution of a comprehensive, consistently administered occupational health program. However, a prerequisite step to the implementation of OHMIS is the compilation of the existing requirement and the identification of an initial set of additional DA occupational health program operating requirements. This step is referred to as the development of an OHMIS procedural manual. As will be seen, due to the mechanism through which the 3 types of occupational health program requirements are entered into the OHMIS data base, the procedural manual for OHMIS will consist largely of a series of input forms. Because of the generic nature of the core OHMIS data processing functions given in this recommended system design, the input forms for OHMIS do not need to be developed prior to the development of the OHMIS computer programs. Instead, the procedural manual can and should be developed at approximately the same time that the programming for the core data processing functions of OHMIS is developed. This will enable immediate loading of the requirements specified in the procedural manual into the OHMIS data base at the completion of the OHMIS computer programs. To start OHMIS, the procedural manual does not need to be comprehensive. It need only prescribe some of the requirements for operating each of the components of an occupational health program. The OHMIS system design is such that changes or additions to the initial program requirements entered can be made at any time. The OHMIS use modules developed in Section III provide an initial structure for identifying the components of an occupational health program for which some initial operating procedures and requirements are needed.

In summary, the approach taken to the development of a recommended system design for OHMIS was to identify a system that will:

- o Meet the 6 overall evaluation criteria
- o Meet the needs of the OHMIS users as identified in the OHMIS use modules given in Section III
- o Provide a management tool for the execution of the requirements of a DA occupational health program, the major components of which are also identified by the OHMIS use modules

## 5.2 MAJOR TYPES OF DATA IN THE OHMIS USE MODULES

As indicated above, the OHMIS use modules identified in Section III cover the expected ways in which OHMIS will be used to perform each of the components of the DA occupational health program. Having



identified these uses of OHMIS, the next step in the development of the OHMIS recommended system design was to determine what are the data processing functions implied for an information system capable of providing these uses and, in particular, a system capable of providing support for the decision-making processes involved in these uses.

To identify the data processing functions implied by the OHMIS use modules, a review of the use modules/program components was made to identify common data elements. This review revealed a striking similarity between almost all of the use modules. The specifications for each of the occupational health program components described in the use modules almost always involved 3 major types of data:

- 1) A set of requirements data for the program component. These requirements specify the actions that are to be taken to perform the functions of the occupational health program component. Some requirements also specify the content of the required action. Often this was done by specifying the content of the forms to be used to enter data during the performance of a required action. In addition, some of the requirements specified the timing of the requirement or its frequency.
- 2) A set of data on the prescribed requirements indicators. The requirements indicators identify the occasions in which a particular type of requirement is to be implemented. These indicators specify the events, conditions or particular type of information that is to indicate that a required action needs to be executed. These indicators can be classed into 3 types. There are indicators specifying that a required action is to take place; (1) on a given date, (2) following a given event, or (3) following the entry of an abnormal reading on a medical test or survey sample, i.e., following the entry of a value exceeding a specified allowable limit.
- 3) A set of data on the prescribed applicability factors that determine which of the several specific requirements of a given type should be implemented. This type of data is used to link each value of a specified applicability factor to a specific content and/or frequency of a required action of a given type. Also, in some instances, there are applicability factors determining whether or not a requirement of a given type is to be executed at all. In these cases, the applicability factors and values are used to qualify a particular requirements indicator. That is, a requirement may be indicated by a given event if and only if the characteristics of the unit involved in that event (e.g., an employee, hazard, or facility) match a specified set of values for applicability factors.

Examples of the use of these 3 types of data in DA occupational health program components can be seen by examining 2 major components: (1) The medical examinations component, and the (2) industrial hygiene survey component.

The medical examination occupational health component is described in the medical examination scheduling use module and the medical events/treatment use module. Examples of the 3 major types of data for this program component include:

- 1) A set of requirements data for medical examination activities. These requirements include:
  - A series of required actions for conducting medical examinations, including actions such as conducting pre-employment physical examinations, conducting hearing and vision tests, monitoring the exposure to ionizing radiation, conducting periodic medical surveillance, checking on the use and fitting of personal protective equipment, following up on abnormal medical exam findings, etc.
  - For many of these actions, some or all of the content of a required action, i.e., what should be included in the required action, is specified in the medical examination program descriptions. For example, what should be included in a pre-employment physical, hearing test, radiation monitoring program, etc., are specified. The content of the medical examinations is often specified on a form for entering data generated during the execution of an exam. For example, much of what should be included in a hearing test (one of the requirements of the medical examination component) is specified on HEARS hearing test forms (Form 2215 and Form 2216).
  - For some requirements, the timing of the required action is specified. For example, the requirement may specify that hearing tests are to be conducted annually.
- 2) A series of indicators, identifying when the various types of medical examination requirements are to be executed. An example of each of the 3 types of indicators are:
  - Periodic medical examinations of a given type are to take place during each employee's birth month (dated indicator);
  - A preplacement medical examination is to take place upon hiring each new civilian employee (event indicator); or,
  - A follow-up examination is to take place whenever an employee's medical test result for blood lead levels exceed 'X' for 'Y' periods of time (allowable limits indicator).
- 3) A series of applicability factors for each type of examination and the corresponding values of these factors

for each set of specific content/timing requirements for the type of examination. Examples of factors that typically determine whether a particular type of examination is applicable and, if so, which particular content and/or timing of the medical examination should be considered to be applicable are: age, job class, sex, personal habits (e.g., whether the person is a smoker or uses birth control pills), etc. For example, hearing tests are frequently specified as being required only for certain job classes. In these cases, the employee's job class is a factor determining whether this type of medical examination is applicable. Similarly, the specification may be that all employees are to receive periodic medical surveillance, but employees over the age of 50 are to receive them more frequently or receive a medical examination that includes additional tests. In this example, age is the applicability factor and the value of 'greater than 50' will be used to identify a different frequency and content for the periodic medical examination as being applicable than the value of 'less than 50'.

A similar set of data is presented in the documents describing the contents of the DA industrial hygiene survey program, i.e., the industrial hygiene survey scheduling and survey use modules and the corresponding industrial hygiene abatement action use module:

- 1) The requirement specified for this program component includes:
  - Required actions, including: conducting of an industrial hygiene survey, following up on a complaint of a hazard, development of corrective actions for hazards identified, following up on corrective actions to determine that they are implemented, evaluating the potential hazardousness of a modification in a facility or a new purchase (supply item), etc.
  - Contents of the required actions, such as the types and methods for taking environmental monitoring test samples; the specific corrective or preventative actions that are required for a given hazard (these can be very detailed, such as the specific ventilation requirements for a given amount of a specific hazard in a given setting); the facility design criteria that are to be employed in a facility modification review; the definitions of the risk associated with a given hazard that are to be used in identifying hazards, etc.
  - The timing of the required actions. An example of this type of requirements data would be the specification that would be the specification that the LOHHI surveys are to be conducted annually for each facility and installation.

- 2) Examples of indicators data for when an industrial hygiene survey or an abatement action is to be conducted, include: whenever a change is made in a facility; whenever a new type of supply is ordered by an organizational unit, whenever the number of reports of hazardous substance spills in a facility exceed 'X' in a given time period, whenever the number of employees in a facility exceeds 'X', when a hazard is identified in a given facility, etc. It should be noted that there is a set of requirements indicators corresponding to allowable limits for medical examinations that apply to industrial hygiene surveys. Just as a given abnormal reading on a medical examination can be the indicator determining whether and which follow-up medical surveillance is needed, so there can be allowable limits tables for industrial hygiene survey sampling results determining whether and which preventive/corrective actions are to be implemented.
- 3) The most important applicability factor determining whether and which type of industrial hygiene survey or abatement action is to be implemented is the type of hazard expected to be encountered. In most instances, it is the particular type of hazard (i.e., the particular value for the factor hazard) that determines the frequency and content of industrial hygiene surveys and abatement actions. Other factors may also be used but these are usually factors that are equivalent to using the type of hazard expected as the factor determining the applicability of the required action. For example, industrial hygiene survey schedules are often based on the organizational unit occupying a facility. For example, facilities occupied by organizational units that are primarily office jobs are usually inspected less frequently than facilities occupied by motor pool activities. In this case, the factor determining the timing of the required action (i.e., the timing of the industrial hygiene survey) is the organizational unit occupying the facility; this factor is used because of the known types of hazards that are expected to be encountered in office versus motor pool types of organizational units.

Many additional examples similar to those given above can easily be identified by examining occupational health program components. These examples show the underlying similarity between the use modules of an occupational health information system: Almost all occupational health program components include data on: (1) requirements, (2) indicators of the events and circumstances in which a requirement is to be executed, (3) factors determining which particular requirement is applicable. Having identified this underlying similarity in the major types of data between the OHMIS use module, the next step in designing OHMIS is to identify the data processing functions required to process these 3 types of data.

### 5.3 DATA PROCESSING FUNCTIONS OF OHMIS: Occupational Health Program Management and Quality Assurance

From the discussion above, it is clear that OHMIS must be able to input and store data on requirements (actions, content of actions and timing of actions), requirement indicators and requirement applicability factors (referred to here collectively as requirements data). However, as indicated previously, it is not sufficient for OHMIS to merely be a repository for requirements data. The objective of OHMIS is to provide a management tool that will be used in the decision-making processes involved in the operation of the Department of the Army's occupational health program. The data processing goals of OHMIS should be to reduce the occupational health program management time and resources required to execute the requirements of the program and to increase the efficiency and quality of the program's operation.

While most of the occupational health program elements of the Army do have documents containing data on requirements, requirements indicators and requirements applicability factors, the systematic use of this data to manage the Army's occupational health program has been inhibited by the lack of an information system for processing this data. Moreover, the review of existing occupational health information systems indicated that there is no current system specifically designed to aid in the decision-making processes involved in the identification and execution of the requirements of an occupational health program. The conventional concept of an occupational health information system appears to have been for the system to act merely as a storage bank for data on requirements and to facilitate the quick retrieval of specified requirements data. The potential for the information system to play an active role in the execution and management of the occupational health program requirements does not appear to have been recognized. Nevertheless, the review of the needs and potential use modules of OHMIS indicates that an information system that would use the requirements data to support the day-to-day operations of an occupational health program is greatly needed. Even more needed is an information system that will help assure that the DA occupational health program is managed in accordance with its goals and policies. In fact, the justification for an occupational health information system that performs many of the critical programmatic functions of an occupational health program, including program management, is believed to be much greater than the justification for the conventional systems which merely store the data resulting from the performance of these functions. For these reasons, the concept of OHMIS performing many of the occupational health program management functions was employed in the development of the core data processing functions for OHMIS. The review of these functions and how OHMIS performs them constitutes the remaining portion of this report.

To act as a management tool, OHMIS must provide support for the process of directing the DA's occupational health program so that the operating policies and goals of the program---namely, the identification and implementation of adequate preventive/corrective

actions for occupational hazards---are met. The requirements data is used to define the specific goals and policies of the occupational health program, i.e., define "adequate preventive/corrective actions". In general terms, the function of OHMIS information in the management of the DA occupational health program is to continuously supply management with the current information about the status of the program so that decisions about what actions are needed to achieve the policies and goals of the program can be made. To actively assist in the management of the occupational health program, however, the information system should go one step further. OHMIS should provide the information needed to help assure that the goals and policies of the program are met. To perform this assurance management function, the OHMIS program should identify the situations in which actions are needed and, based on the input from occupational health program managers and personnel on the prescribed policies and goals "remember" what types of actions are needed to operate the program as planned, i.e., in accordance with the program policies and goals. By performing this assurance management information system function, OHMIS will provide decision makers with information comparing the current status of the occupational health program component to the policies and goals for that component, thereby cueing managers about when corrections are needed to reduce the differences between the current status and the goals for the program. Thus, the fundamental assurance management functions of OHMIS should be to identify the occasions in which previously specified required actions are needed in order to achieve the goals of the program and to provide managers at all levels with information on the status of the implementation of these actions.

Specifically, OHMIS will assure that specified requirements are:

- 1) Triggered, i.e., the occasions in which the requirements apply are routinely identified by all levels of DA occupational health program managers; and,
- 2) Audited, i.e., the implementation of the requirements is monitored and evaluated to assure that the requirements are completed in accordance with the specified performance criteria for the requirements, i.e., in accordance with the content and timing requirements associated with the required actions.

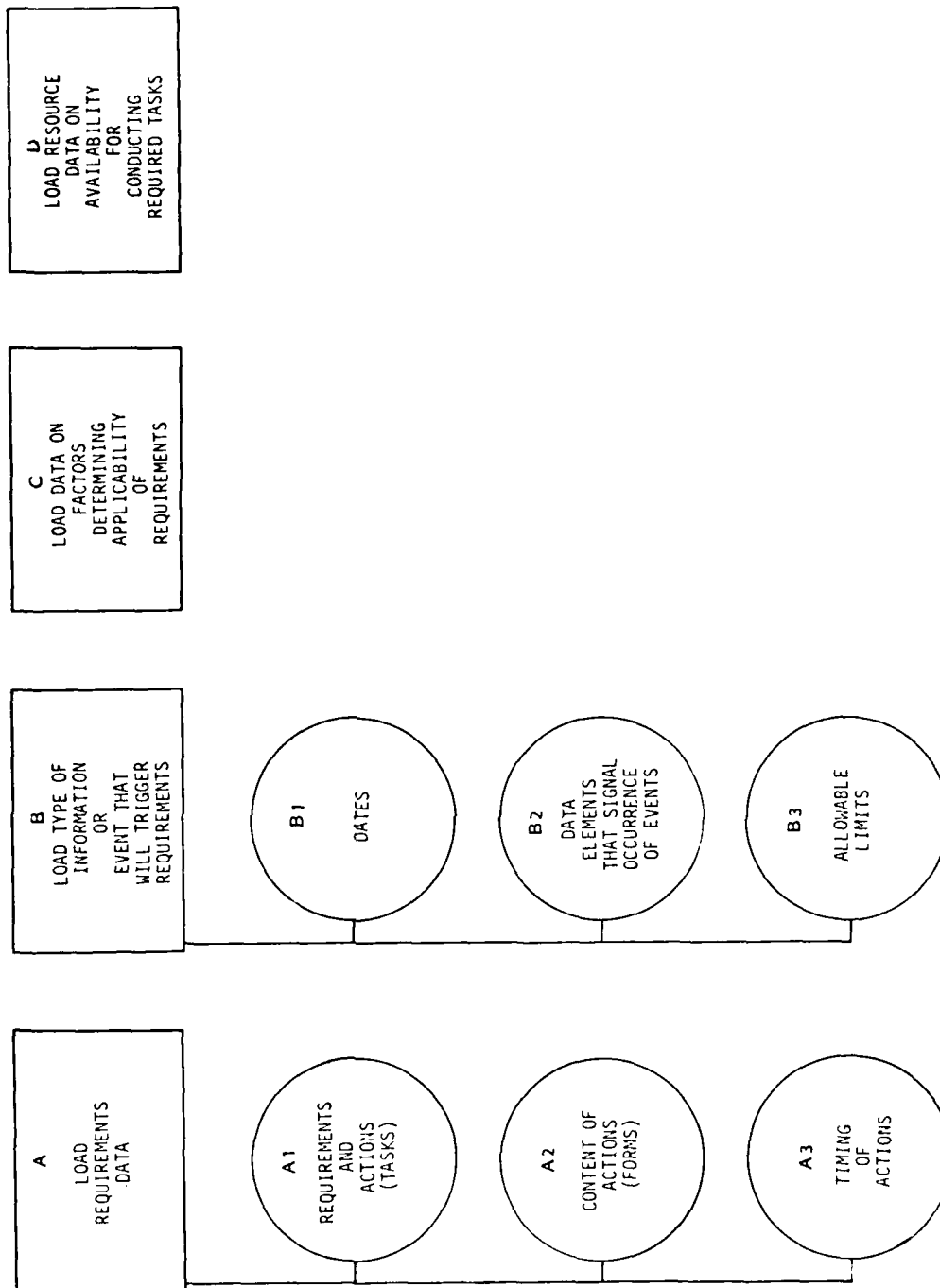
These two management functions are currently being performed to a large degree by DA occupational health managers and personnel. However, OHMIS will help assure that these functions are done much more systematically and consistently than can be achieved without an assurance management information system. The OHMIS information system will have the capability to "remember" and monitor requirements with a much higher degree of accuracy and comprehensiveness than is possible by manual program management.

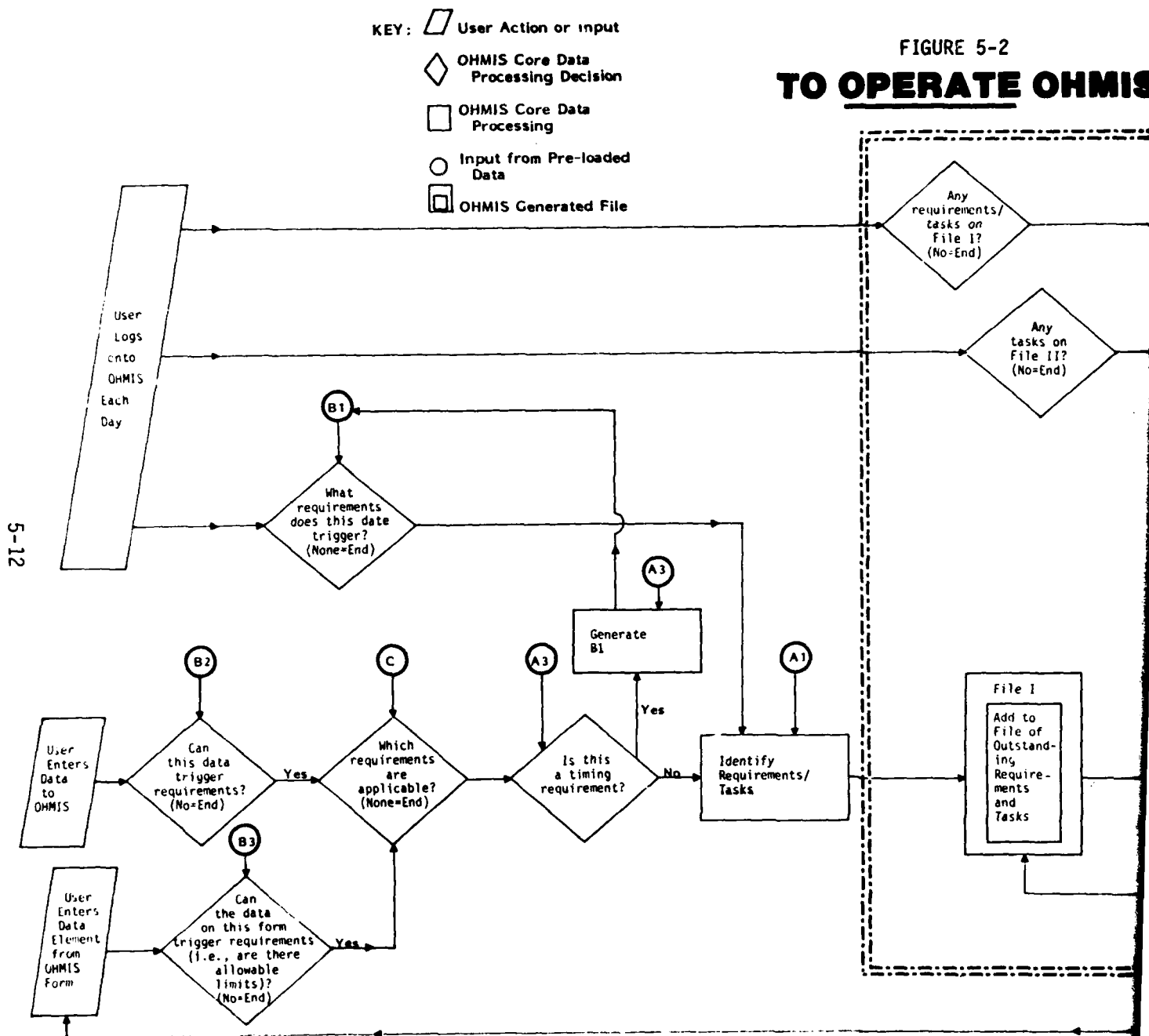
#### 5.4 RECOMMENDED SYSTEM DESIGN FOR OHMIS

FIGURES 5-1 and 5-2 show the recommended system design for OHMIS in terms of the data processing functions that it will perform. These

FIGURE 5-1

**TO START OHMIS:**

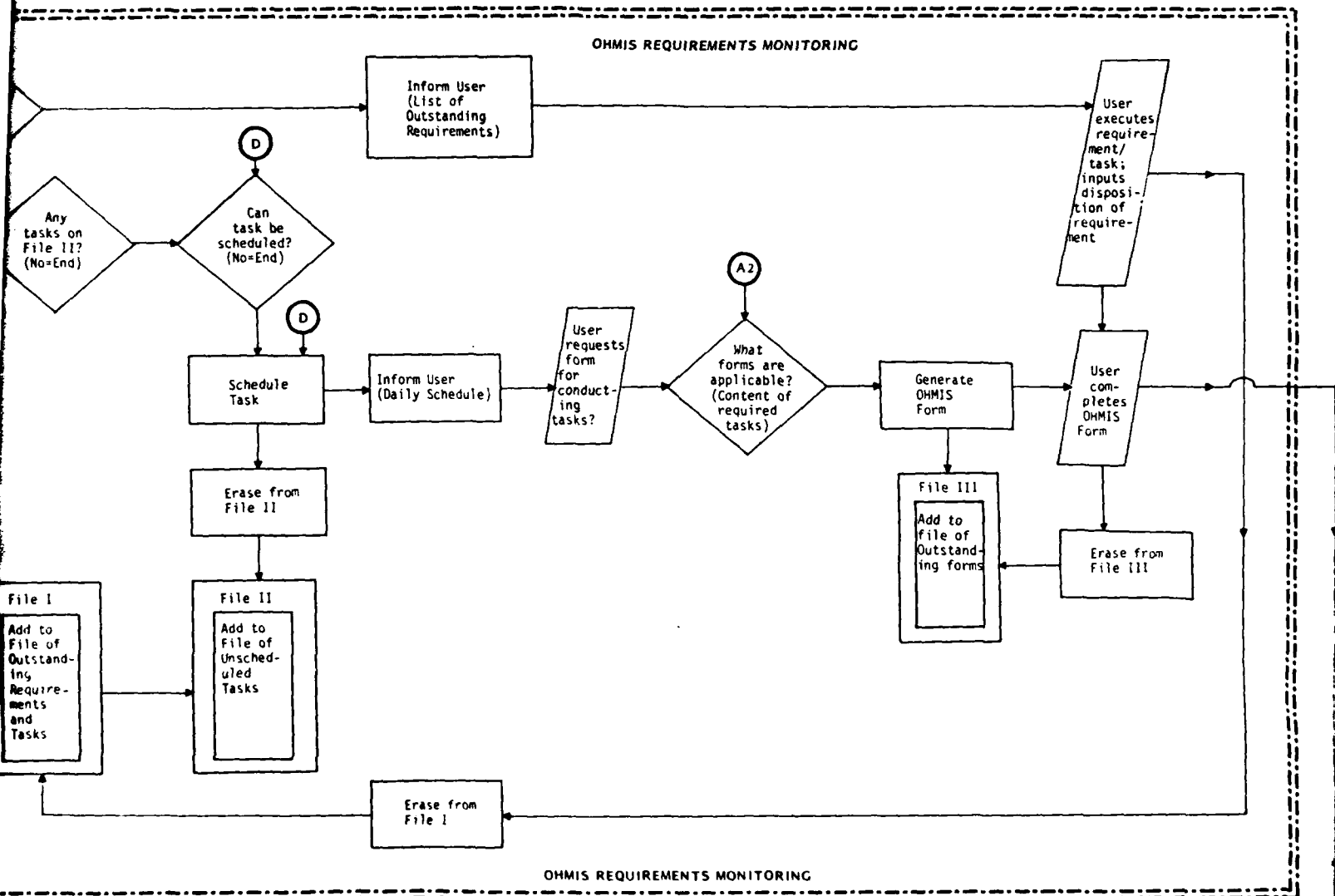




5-12



# OHMIS:



FIGURES show how OHMIS will function to assure that the DA occupational health program operates in accordance with the policies and procedures specified by the program managers at all levels.

FIGURE 5-1 shows the four basic data types that must be initially "loaded" into the OHMIS data base prior to the start of the operation of the OHMIS for the assurance management data processing functions to be performed. The first three of these data types are the major, common data elements found in the current DA occupational health program descriptions, as identified above, namely, requirements data, requirements indicators, and requirements applicability factors data. Each of these three types of data has been given a code in order to show on FIGURE 5-2 how each of these types of data is used to operate OHMIS. Specifically, the 4 major types of data that must be initially loaded into OHMIS are:

- A) Requirements data. This includes data on required actions or tasks (Data Type A1), data on the content of a required action (usually specified on the OHMIS data entry forms that are used to perform actions and identified as Data Type A2) and data on the timing of requirements (Data Type A3).
- B) Requirements indicators. This is data on the events or information that should trigger a requirement. This is the data that OHMIS will use to perform the first major assurance function, namely, that of identifying the circumstances in which a requirement applies. As indicated above, requirements indicators data can be dates (identified as Data Type B1), data that signals the occurrence of events that are to trigger requirements (identified as Data Type B2) or values for abnormal readings (allowable limits) that should trigger requirements (identified as Data Type B3).
- C) Requirements applicability factors data. This is the data on the factors that determine whether a requirement applies and, if so, which particular requirement applies. This type of data has been identified as Data Type C.
- D) In addition to the above 3 types of data, a further data type (Data Type D) must be loaded onto the OHMIS data base prior to the operation of OHMIS. This is data on the availability of DA occupational health program personnel to perform actions specified by the requirements data. This data includes the identification of which persons are qualified to perform each required action and the man-hours available to perform required actions at any given point in time. This information is used by OHMIS to automatically schedule a task as soon as the OHMIS program has identified this task as a required action.

FIGURE 5-2 shows the data processing by which OHMIS uses the data types to perform the occupational health program management assurance function. The data processing decisions and steps in which each of

the 4 data types are used are shown on FIGURE 5-2 through the symbol of a small circle with the letter identifying a data type contained in the circle.

FIGURE 5-2 shows the functions that OHMIS will perform to assure that all DA occupational health program requirements are triggered and audited and the points at which the data that was preloaded into OHMIS (i.e., data types A through D) are used to perform these functions. Specifically, FIGURE 5-2 shows that OHMIS uses the preloaded data to:

- 1) Decide whether a requirement should be triggered. This includes determining whether a timing requirement has been specified and, if so, generating a new set of date requirements indicators data (data type B1).
- 2) Decide what requirements should be triggered, i.e., what requirements are applicable.
- 3) Schedule the task specified by the requirements.
- 4) Generate the OHMIS forms needed to conduct the required tasks in accordance with the content specifications of the requirements.
- 5) Monitor outstanding tasks and forms until they are completed.
- 6) Provide a means for entering data from OHMIS forms. This entry of data will result in the OHMIS program starting the core data processing functions over again, beginning with step (1), i.e., the program will determine whether the data entered on an OHMIS form should trigger a requirement; if so, what requirement should be triggered; etc.

The exact data processing algorithms to which each of these steps is accomplished is given in Section VI, which provides the Functional Data Flows for a recommended system design for OHMIS.

SECTION VI - RECOMMENDED SYSTEM DESIGN - PART 2  
Functional Data Flows

## VI. RECOMMENDED SYSTEM DESIGN - PART 2

### Functional Data Flows

This Section of the report provides the detailed IPO's (Input/Processing/Output) of the recommended OHMIS system design in sufficient detail for programming. The data processing algorithms for the core OHMIS data processing functions are given in I/P/Os called Functional Data Flows. Section 6.1 provides clarification of the scope and limitations of this Section of the report. Section 6.2 provides definitions for the set of special terms used in the Functional Data Flows. Section 6.3 describes the four basic types of data used in the core OHMIS data processing functions. Section 6.4 provides an overview of each of the core data processing functions in the OHMIS system. Section 6.5 provides the Menu Selection Sequences for the OHMIS core programs. Section 6.6 provides a detailed description of the 28 data sets (inputs) used in the OHMIS core programs. Section 6.7 provides the 17 outputs generated by the OHMIS core programs. Section 6.8 provides the IPO Functional Data Flows for each of the eleven core data processing functions in OHMIS.

#### 6.1 SCOPE OF THE FUNCTIONAL DATA FLOWS

The purpose of the Functional Data Flows given in this Section of the report is to provide a description of the generic (core) data processing functions of the recommended OHMIS system at a level of detail that, with the exception of the decisions about file structure and data element field sizes, is sufficient to be suitable for programming, provided guidance is given to the programmer at various intervals. Specifically, the Functional Data Flows provide the IPOs for performing the requirements triggering and monitoring functions shown on FIGURE 5-2. The operative phrase in the above statement is 'data processing functions'. Specifically, this document is not a user's manual. That is, this Section of the report does not describe the procedural functions needed to operate the OHMIS program. It is confined to the data processing functions, many of which will be transparent to the user. It covers in great detail the generic process of inputting OHMIS data and assuring that the DA requirements for an Occupational Health Program that are affected by this data are identified and monitored until completed. However, the description of the day-to-day procedures that the Industrial Hygienist and Occupational Health Nursing staff at the DA installation level (i.e., the day-to-day users of OHMIS) will employ to collect and use data from the OHMIS system in the operation of an Occupational Health Program will need to be described in another document, referred to here as the "OHMIS Users' Procedures Manual", that is not within the scope of work under which this document was prepared.

The OHMIS program has been deliberately designed to allow for frequent and extensive changes and for local variations in the specific types of data collected, the requirements prescribed and monitored and the analyses made. To do this, it was necessary to define the OHMIS system in generic terms. That is, the core program logic for the OHMIS

system given in this report covers the input/processing/output functions for all OHMIS data. The design of the OHMIS system is such that all of the technical and programmatic data (referred to as requirements data) is input to the OHMIS data base at the onset of the system in accordance with current DA policies and local installation needs and modified as needed to comply with changes in regulations and needs.

Thus, for example, the core OHMIS program logic provides the mechanism for the user to define the exact types and content of each OHMIS medical examination form. This not only means that different forms can be developed by different medical specialties, but different forms can be developed for different job classes, depending on the types of hazards for which medical surveillance is expected to be needed for each job class. Of course, any modifications in the forms needed to comply with newly identified hazards, changes in regulations, special studies, etc. can readily be made. Also, using the OHMIS design, it will be possible to make any special adaptations to these forms that are needed in an installation. The core OHMIS program also provides a mechanism for inputting the data on each form that is developed for evaluating the data entered on these forms and for triggering, scheduling and monitoring the implementation of requirements prescribed by the user for responding to the specific results of the evaluations of the data entered on these forms.

The description of the OHMIS program logic provided in this report gives detailed data processing steps for each of these mechanisms and is therefore comprehensive. However, no reference to any particular input form is made except in examples to show how the data processing functions would be used. The input programs that are described in this report cover processes such as the input of requirements data or scheduling resources data. The input of the data from a completed form is also described. However, these detailed data processing steps refer to the input of data from any OHMIS-designed form (because the data processing has been structured to be the same for any form regardless of its content) and, therefore, these steps do not describe the contents of any particular form.

Similarly, because the OHMIS program envisions a user query type of mechanism for generating outputs, the OHMIS outputs described in this report are also generic in nature. The user query system for generating outputs allows the user to generate an output covering any data set defined by the user or any set of contents from an OHMIS-designed form defined by the user. Therefore, it is not necessary to describe the contents of any particular output in this report. The outputs that are described in this report cover the types of outputs needed to manage and audit an Occupational Health Program, rather than any particular set of Occupational Health Program data. For example, the contents of an output listing all required actions needed for the Occupational Health Program that have been completed is given in this report. This output, called the Outstanding Requirements List (Output 04) is a generic output that can be used for a wide variety of

purposes, ranging from summarizing identified corrective actions that need to be implemented (i.e., an abatement log) to listing investigations that need to be made for organizational units having excessive numbers of incidents involving hazardous substances (i.e., a potential hazard identification log). The exact use made of this output will depend on the type of outstanding requirements that the user requests for any particular generation of the output.

Similarly, the Daily Schedule (Output 014) described in this report, can be used to describe the scheduling of a wide variety of tasks, ranging from routine medical examinations to Industrial Hygiene surveys. The exact contents of outputs are not described; only the format and functions of outputs are described. Many of the outputs described in this report are used solely for information system management functions. For example, the Outstanding Data Requests Lists (Output 013) which tells the OHMIS Data Processing Staff what forms have been generated and sent out for completion but have not been returned, is used to ensure and facilitate quality control of OHMIS data.

The 'Menus' shown in Section 6.5 provide the points of user input and user requests for output for the core OHMIS functions. Not all functions are listed on the Menus, because many of the functions are transparent to the user. Sections 6.6 and 6.7 provide a series of Data Sets (inputs) and a series of Outputs for each OHMIS function. Those data processing steps that are merely entry of or output of data element types that have been described in detail in the Data Sets and/or Outputs are not redescribed in the Functional Data Flows.

Only a tentative file structure for the OHMIS data base has been defined in this report. This is because it is felt that the decision on the file structure should await the final program logic and documentation and the exact hardware configuration chosen for operating OHMIS. The tentative file structure provided for in this report is based on separate records for each OHMIS form specification. However, this file structure is only offered in order to provide a means of describing the data processing functions. That is, it provides a storage framework with which to describe the manipulation of the OHMIS data. It is expected that significant changes in this file structure will be made when the final storage design is determined.

Although the Functional Data Flows given in this report do provide a complete set of detailed data processing steps for performing each function, it is expected that some aspects of the particular method described here for data processing will be changed in the final program logic to add greater efficiency or to better fit the final file structure chosen for OHMIS. These Functional Data Flow steps should be considered as an example of how the data processing might be conducted; each example given provides a complete data processing logic that meets all of the all of the functional requirements that OHMIS should be designed to perform.

Before proceeding to the general description of the OHMIS program, a series of definitions of terms used in this Section of the report and in the Functional Data Flows is given.

## 6.2 DEFINITION OF TERMS

In order to describe the OHMIS system in a generic way without prescribing a particular file structure and without defining any particular forms or outputs (other than management outputs), it was necessary to generate a lexicon of terms. As these terms are used throughout Section VI of this report, this Section begins by defining these terms.

### 6.2.1 'Code Types' vs. 'Identifiers'

A basic distinction that is made throughout this discussion is the difference between a name or number that classifies a person or thing (referred to as Code Types) and a name or number that identifies a particular item or person (referred to as Identifiers). There are many examples of this distinction, but a few common ones are:

- o A facility type code might be a code for all facilities classified as 'food service areas', while a facility identifier would identify a particular building, e.g., 'building HT-4' (number) or the 'building on H and I Streets' (name);
- o A job class type might be 'welders', while the identifier for a job class would identify a particular position in a particular organizational unit and in a particular installation;
- o A task type might be 'Industrial Hygiene surveys', while an example of a particular task that would be assigned an identifier would be 'Industrial Hygiene survey in facility HT-4, conducted on 1/3/83'; etc.

The primary difference shown by these examples is that a type code has a meaning and, therefore, says something about the person, idea or thing being described, while an identifier has no meaning attached to it and is used only to assign a unique value to a particular person, activity or thing in order to precisely distinguish it from all other persons or things.

In the terminology used in this report, the number used to classify a person, thing or idea (e.g., a task) is called a code. The OHMIS system will include a vocabulary word/phrase list that provides a dictionary with the meanings of each code. There will be several sets of such codes. Thus, there will be a set of codes and meanings for types (classifications) of facilities, job classes, forms, documents, tasks, requirements, etc. The exact nature and structure of these OHMIS vocabulary words/phrases will be developed at a later date. However, throughout the discussion in this report, it has been necessary to refer to and distinguish different sets of codes. To identify each set of codes that, at this time, is known to be needed for the operation of OHMIS, the term Code Type was originated. Thus, to make it clear in a Functional Data Flow that what is referred to is the set of codes that will be developed to classify facility types as opposed to document



types, the Functional Data Flows refer to the set of codes for facility types as Code Type 7 (CT7 in abbreviated form) and the set of codes that will be developed for document types as Code Type 3 (CT3). FIGURE 6-1 shows the list of Code Type numbers used in this report. This list is by no means an exhaustive list of Code Types that will be needed in OHMIS. This list is only those particular sets of codes that were needed to describe the eleven core data processing functions of OHMIS or to give examples of how these functions will work. The actual codes developed for the operation of OHMIS will be a combination of existing standard codes, e.g., those used by DoD and other organizations, and the new codes required to meet the special needs of OHMIS.

The terminology used in this report for the number used to identify a particular item or person or idea is an Identifier. As with code types, there will be a number of sets of identifiers in the OHMIS system, each set providing a number to uniquely identify a person or thing in that set. For example, there will sets of identifiers identifying persons (called employee identifiers; these will probably be Social Security Numbers), facilities, documents, etc. FIGURE 6-2 shows the list of sets of identifiers used in this report. Each set of identifiers has been given a number in order to make clear which set of identifiers is being referred to. For example, Identifier 3 (ID3 in abbreviated form) was used to refer to the set of identifiers that will be developed to itemize documents in the OHMIS system.

As with the Code Type list in FIGURE 6-1, the list of sets of Identifiers in FIGURE 6-2 is not exhaustive, but only presents those sets of identifiers needed to describe the core OHMIS functions. Many of the identifiers shown on FIGURE 6-2 are identifiers used to distinguish a Data Set (DS). Thus, each separate set of Requirements Check Request Data (Data Set 2) in the OHMIS system will be assigned an identifier to uniquely identify that set of data from all other sets of Data Set 2s. In the convention used in this report, the set of identifiers that is used to distinguish different Data Set 2s is referred to as an Requirement Check Request Identifier and is assigned the number ID1 to distinguish it from other sets of identifiers used in this report.

A comparison between FIGURES 6-1 and 6-2 will show that there is often a set of Code Types and a set of Identifiers for the same item. This is because items can be assigned both an Identifier and a Code Type. Thus, a facility can be classified as a 'food service area' and assigned the Code Type associated with that meaning for facility types and be identified as 'Building HT-4' and assigned an Identifier to distinguish this particular building. As with Code Types, the OHMIS data base will keep a list of the names associated with each Identifier. To the greatest extent possible, existing Identifiers will be used, e.g., existing building numbers will be used to identify facilities. However, as the historical data maintained in OHMIS is extensive and critical to its use, stringent quality control measures will need to be exacted to ensure that a code or an identifier is used only once, that its meaning does not change, etc.

FIGURE 6-1

TITLES OF CODE TYPES

| <u>Code Type Number</u> | <u>Code Type Title</u>   |
|-------------------------|--|
| CT1                     | OHMIS user type (see ID13)                                     |
| CT2                     | OHMIS position type (see ID14)                                 |
| CT3                     | OHMIS requirement type (see ID5, ID6, and ID9)                 |
| CT4                     | Data element type (see DS7)                                    |
| CT5                     | Organizational level type (see ID7, ID8, ID10, ID11, and ID12) |
| CT6                     | Document type (see ID3)  |
| CT7                     | Facility type  |
| CT8                     | Task type (see DS23)   |
| CT9                     | Form type  |
| CT10                    | Identifier type (see Identifier Numbers)                       |
| CT11                    | Time use code  |

FIGURE 6-2

TITLES OF IDENTIFICATION NUMBERS

| <u>Identification<br/>Number</u> | <u>Identification<br/>Title</u>                              |
|----------------------------------|--|
| ID1                              | Requirements check request identifier (see DS2)              |
| ID2                              | Triggering step identifier                                   |
| ID3                              | Documentation identifier (see CT6)                           |
| ID4                              | Employee identifier  |
| ID5                              | Requirement application identifier (see DS3, DS4, and DS17)  |
| ID6                              | OHMIS requirement (recommendation) identifier (see CT3; DS1) |
| ID7                              | Job class identifier   |
| ID8                              | Facility identifier  |
| ID9                              | Requirement implementation identifier (see DS5)              |
| ID10                             | OHMIS service area identifier                                |
| ID11                             | Installation identifier                                      |
| ID12                             | Organizational unit identifier                               |
| ID13                             | OHMIS user identifier (see CT1)                              |
| ID14                             | OHMIS position identifier (see CT2)                          |
| ID15                             | Document subpart identifier (see ID3)                        |
| ID16                             | Form specification identifier (see DS10)                     |
| ID17                             | Form subpart identifier (see DS11)                           |
| ID18                             | Completed form identifier (see DS14)                         |
| ID19                             | Forms application identifier (see DS13)                      |
| ID20                             | Allowable limits application identifier (see DS16)           |

FIGURE 6-2 (Cont'd.)

| <u>Identification<br/>Number</u> | <u>Identification<br/>Title</u>                             |
|----------------------------------|---|
| ID21                             | Missing data element type information identifier (see DS19) |
| ID22                             | Allowables limit check request identifier (see DS18)        |
| ID23                             | Task identifier (see DS24)                                  |
| ID24                             | Time period specification identifier (see DS20)             |
| ID25                             | Allowable limits table identifier (see DL19)                |
| ID26                             | Contact identifier (see DS28)                               |
| ID27                             | Monthly schedule identifier (see DS27)                      |
| ID28                             | Weekly schedule identifier (see DS26)                       |

### 6.2.2 Terms for Types of Persons/Groups

Eight terms have been used to identify several types of persons or groups of persons that bear a special relationship to OHMIS. These eight terms are: 1) OHMIS service area; 2) employee; 3) OHMIS user; 4) OHMIS Data Processing Staff; 5) OHMIS position; 6) organizational unit; 7) requirement implementation unit; and 8) forms unit.

1) OHMIS Service Area. This term is used to identify a boundary within which all OHMIS functions will be performed by the same OHMIS office. In most cases, the boundaries for an OHMIS service area will be the same as the boundaries for an installation, but in some cases more than one small installation may be served by one OHMIS office. This is the reason that the term 'OHMIS service area' is used instead of installation. During initial implementation of OHMIS, the boundaries of each OHMIS service area will be defined. Within such a boundary, all of the data on the persons, facilities and supplies (hazards), etc. will be handled by the same OHMIS service area office. Each OHMIS service area will be assigned an OHMIS service area identifier (shown on FIGURE 6-2 as the ID10 set of identifiers).

Almost all OHMIS data processing functions will be handled by OHMIS service areas. Each service area may develop its own specifications for forms, its own sets of Occupational Health Program requirements, its own scheduling system, etc. Most sets of data in the OHMIS data base will have an OHMIS service area identifier (ID10) on them.

Each OHMIS service area will interact with one and only one of the five Regional Data Centers in VIABLE. It is envisioned that the OHMIS data base storage and retrieval system from the VIABLE Regional Data Centers will be organized to enable ready access by an OHMIS user from a given service area to all current data on the persons, facilities, outstanding requirements, etc. for that OHMIS service area.

Most "things" (as distinguished from "persons") will always remain in the same OHMIS service area, e.g., a facility will always be in one and only one service area. However, people will necessarily move from one OHMIS service area to another. It will be necessary to organize the interaction between each OHMIS service area and the VIABLE Regional Data Centers so that the current data on a person who has newly moved into an OHMIS service area can be retrieved and used routinely by that service area without having to use excessive data communication resources.

2) Employee. This term is used generically to refer both to civilians employed by the Department of the Army and to military members of the Department of the Army.

3) OHMIS User. This term is used to refer to the group of persons who will be directly interacting with the OHMIS computer system. These persons will be authorized to input and output data from OHMIS. Each user will be assigned an OHMIS user identifier (shown on FIGURE 6-2 as the set of identifiers with the number ID13) and a 'password'. The combination of the user's ID13 number and password will be used to control the types of interactions with the OHMIS data base, e.g., what

types outputs may be generated, what changes may be made to the data, etc. An employee who is also an OHMIS user will thus have both an employee identifier (Identifier Set ID4) and an OHMIS user identifier (ID13).

4) OHMIS Data Processing Staff. It is envisioned that OHMIS users will be classified into several groups by the type of relationship they bear to OHMIS. (This set of Code Types is identified on FIGURE 6-1 as CT1.) One particular type of OHMIS user that is referred to throughout this report is the OHMIS Data Processing staff person. An OHMIS Data Processing staff person is expected to be identified for each OHMIS service area. This person need not be a computer programmer or even have extensive knowledge of computer systems. In most cases it is envisioned that this person will be a clerk or a person who performs clerical duties. It is recognized that it is not possible to have a person with computer science background in every OHMIS service area. This term is only used to identify the person who will have primary responsibility for handling routine OHMIS data processing functions, such as the generation of the Daily Schedules (Output 014) in a given OHMIS service area.

5) OHMIS Position. This is a term used to identify a person in an office or job class that performs a particular OHMIS function. As with OHMIS users, there are OHMIS position identifiers (ID14s) and OHMIS position type codes (CT2s). Examples of types of OHMIS positions would be an Occupational Health Nurse, Industrial Hygienist, Physician, etc. Some positions outside of the OHMIS organization will also be classified as to their relationship to OHMIS and will therefore need to have an OHMIS position identifier. For example, it is anticipated that certain positions in the personnel office will need to be designated as OHMIS positions in order to classify and refer to data about these positions in the OHMIS data base. Also, it is envisioned that a point of contact with various organizational units will be needed. The person in a job class or organizational unit designated as the point of contact for OHMIS may need to be classified and assigned an OHMIS position identifier. Throughout this report, such persons are referred to as the type of person filling the OHMIS Liaison Supervisor type of position.

6) Organizational Unit. This term is used generically to refer to any set of individuals grouped organizationally at a level higher than job classes. This term applies to both military groups and civilian groups.

7) Requirement Implementation Unit. This term is the general term used to identify the particular person or thing about which a particular requirement will be implemented. For example, a requirement for a medical exam will have the employee identifier of the person of will receive the exam as the requirement implementation unit. For a requirement to conduct an IH survey, the facility identifier of the facility in which the survey will be conducted is the requirement implementation unit.

8) Forms Unit. The person or thing which is described by a particular set of data on a form is referred to the forms unit. For

example, on a form providing data describing a hazard, the identifier for the hazard would be the forms unit.

### 6.2.3 Formatting Terms

Five terms have been used to identify a particular component of the data processing description given in this report. These terms are: 1) Menu Selection Sequence; 2) Data Set; 3) Data List; 4) Output; and 5) Functional Data Flows, also called Functions.

1) Menu Section Sequence. The OHMIS programs are "Menu driven," that is, a user indicates which program component is desired by selecting and entering the value for one of the items on a Menu presented to the user. Section 6.5 of this report gives the Menus for the OHMIS core data processing functions. Often it will be necessary for the user to make a selection from a series of Menus, each selection leading to another Menu from which the user further defines his/her request. A particular series of selections from the Menus provided in OHMIS is referred to in this report as a 'Menu Selection Sequence'. Thus, in Section 6.5, it can be seen that 'Menu Selection Sequence 1.2.3' would refer to the selection made by selecting:

- o Item '1' on Menu 0 (first level menu, which would result in the user being presented with Menu 1;
- o Item '2' on Menu 1 which would result in the user being presented with Menu 1.2; and
- o Item '3' on Menu 1.2.

As can be seen in the Menus given in Section 6.5, the user would select 'Menu Selection Sequence 1.2.3' if s/he wishes to 'Generate an Outstanding Requirements Checks Needed List (Output 02)'.

2) Data Set. This term refers to a group of inputs of data or a configurations of data element types used in the functional data flows for the OHMIS core functions. FIGURE 6-3 provides a list of the titles of these data sets. As can be seen, a Data Set is identified by a 'DS' number, e.g., DS1 refers to the set of data elements describing an OHMIS requirement, i.e., the set of data element types included in OHMIS Requirement Recommendation Description Data. Although the file structure for OHMIS has not been determined at this date, it may be useful to think of Data Sets as one would think of 'records', where each data element type on a Data Set represents a 'field' in an OHMIS 'record'.

Section 6.6 contains a detailed description of each Data Set on FIGURE 6-3. Much of the content of how the OHMIS system will operate is contained in these descriptions of Data Sets. These descriptions provide information on the purpose and use of each type of Data Set, how the Data Set is generated or entered (i.e., the Menu Selection Sequence for entering a set of data of the type identified by the Data Set Number), how this type of Data Set is stored and deleted from the OHMIS data base, etc.

3) Data Lists. This term is used loosely to refer to a series (i.e., multiple entries) of sets of data element types in which each of the sets of data belong to the same data element type or the same combination of data element types. Functionally, Data Lists are used in the description of the OHMIS system provided in this report as 'files', i.e., multiple entries of the same records. However, as indicated above, the particular file structure implied in the use of Data Lists in this report should not be assumed to be the final determination about the OHMIS file structure, but rather, a convenient means of describing the organization of data in OHMIS in order to be able to describe the desired characteristics of the OHMIS data processing functions. FIGURE 6-4 gives the Data Lists used in the description of the OHMIS core data processing functions. Many of these files serve the function of indexes to the rest of the OHMIS data base, i.e., to the Data Sets, in order to enable quick retrieval of the data with a specified identifier.

4) Outputs. FIGURE 6-5 provides a list of the Outputs described in this report. Each of these Outputs is described in detail in Section 6.7. The descriptions include a mock-up of each Output and the source for each of the data elements in the Output. As indicated above, these are the generic outputs used in the management of the OHMIS system. Specific outputs covering a given set of data are not given in this report, because this would serve only to repeat the detailed descriptions of the Data Sets given and because the exact contents of the data entered (and, therefore, the exact contents of the outputs) will depend on the specifics of the forms specified by OHMIS users.

5) Functional Data Flows or Functions. FIGURE 6-6 provides a list of the titles and numbers of the OHMIS functions described in detail in this report. These 11 functions have been grouped into four groups. Each Functional Data Flow description begins with a document summarizing the function. This is followed by a description of each data processing step in the function. The description of each data processing step includes:

- o A description of the step;
- o The previous step that led to this step;
- o The Inputs to the step. These include:
  - The Menu Selection Sequence (if any) which the user uses to arrive at this step in the OHMIS program and the user Input Sequence associated with the Menu Selection Sequence.
- o The Data Retrievals (i.e., retrievals from the OHMIS data base) made by the program to obtain the appropriate data elements for conducting the processing involved in the step;
- o The specific Data Processing involved in the step;
- o The Outputs generated during the step, if any, including the new Data Sets generated by the OHMIS program as a part of the step.



FIGURE 6-3

TITLES OF DATA SETS

| <u>Data Set Number</u> | <u>Data Set Title</u>   |
|------------------------|---|
| DS1                    | OHMIS requirement (recommendation) description data (see ID6)   |
| DS2                    | Requirements check request data (see ID1)   |
| DS3                    | (Information triggered) requirements applicability data (see ID5)   |
| DS4                    | Requirements suspense data (i.e., date triggered requirements applicability data), including reminder notice data (see ID5) |
| DS5                    | Requirements implementation data (see ID9)  |
| DS6                    | Triggering step requirement implementation unit identifier types data   |
| DS7                    | Data element type information   |
| DS8                    | Values data for requirement applicability characteristics   |
| DS9                    | Current user/position identity and address data   |
| DS10                   | Forms description data (see ID16)   |
| DS11                   | Forms subpart data (see ID17)   |
| DS12                   | Forms applicability factors data  |
| DS13                   | Forms applicability values data (see ID19)  |
| DS14                   | Completed forms data (see ID18) [generic description]   |
| DS15                   | Allowable limits applicability factors data   |
| DS16                   | Allowable limits applicability values data (see ID20)   |
| DS17                   | Allowable limits specification data (see ID5)   |
| DS18                   | Allowable limits check request data (see ID22)  |

FIGURE 6-3 (Cont'd.)

| <u>Data Set Number</u> | <u>Data Set Title</u>                                |
|------------------------|--|
| DS19                   | Missing data element information (see ID21 and DL25) |
| DS20                   | Time period specification data (see ID24).           |
| DS21                   | Allowable limits table data (see ID25)               |
| DS22                   | Outstanding (uncompleted) forms monitoring data      |
| DS23                   | Task description data (see CT8)                      |
| DS24                   | Specific task scheduling data (see ID23)             |
| DS25                   | Facility data by task type (CT8)                     |
| DS26                   | Regular weekly schedule availability data (see ID28) |
| DS27                   | Monthly schedule data (availability and use)         |
| DS28                   | Contact and location data (see ID26)                 |

FIGURE 6-4

TITLES OF DATA LISTS

| <u>Data List Number</u> | <u>Data List Title</u>   |
|-------------------------|--|
| DL1                     | Vacant job class list (see 06)   |
| DL2                     | Potential new hire list (see 07)   |
| DL3                     | Outstanding requirements list (ID9) by OHMIS service area (ID10) (see 04)  |
| DL4                     | New hire list (see 08)   |
| DL5                     | List of requirements applicability characteristics for which values are missing  |
| DL6                     | OHMIS user/position identifier (ID13/ID14) by OHMIS service area (ID10) list   |
| DL7                     | OHMIS user identifier (ID13) by password list  |
| DL8                     | OHMIS user/position identifier (ID13/ID14) by OHMIS user/position type (CT1/CT2) list  |
| DL9                     | Reminder notice list (ID9 and ID5) by OHMIS service area (ID10)  |
| DL10                    | List of active requirement application identifiers (ID5) for information triggered requirements applicability data (DS3) by triggering step (ID2) and by OHMIS service area (ID10) |
| DL11                    | List of active requirement application identifiers (ID5) for requirement suspense data (DS4) by OHMIS service area (ID10)  |
| DL12                    | List of requirements check request identifiers (ID1) by OHMIS service area (ID10)  |
| DL13                    | List of active form specification identifiers (ID16) by form type (CT9) and by OHMIS service area (ID10)   |
| DL14                    | List of active (allowable limits specification) requirement application identifiers (ID5) by forms subpart identifier (ID17) and OHMIS service area (ID10)                         |

FIGURE 6-4 (Cont'd.)

| <u>Data List Number</u> | <u>Data List Title</u>  |
|-------------------------|---|
| DL15                    | List of active allowable limits application identifiers (ID20) by forms subpart identifier (ID17) and by OHMIS service area (ID10)  |
| DL16                    | List of active (allowable limits specification) requirement application identifiers (ID5) by active allowable limits application identifier (ID20) and by OHMIS service area (ID10) |
| DL17                    | List of allowable limits check request identifiers (ID22) by completed form identifier (ID18) and by OHMIS service area (ID10)  |
| DL18                    | List of active (allowable limits specification) requirement implementation identifiers (ID9) by completed form identifiers (ID18) and OHMIS service area (ID10)                     |
| DL19                    | List of all active allowable limits table data (DS21) for a given allowable limits table identifier (ID25)  |
| DL20                    | List of the active default (allowable limits specification) requirement application identifiers (ID5) by the forms subpart identifier (ID17) and by the OHMIS service area (ID10)   |
| DL21                    | List of the active default forms specification identifier (ID16) by the form type code (CT9) and OHMIS service area (ID10)  |
| DL22                    | List of active allowable limits application identifiers (ID20) by forms specification identifier (ID16) and by OHMIS service area (ID10)  |
| DL23                    | Current forms list  |
| DL24                    | List of form application identifiers (ID19) by form type code (CT9) and OHMIS service area (ID10)   |
| DL25                    | Missing data element list (see DS19)  |

FIGURE 6-4 (Cont'd.)

| <u>Data List Number</u> | <u>Data List Title</u>   |
|-------------------------|--|
| DL26                    | List of new outstanding data requests (ID18) (not overdue) by OHMIS service area (ID10)  |
| DL27                    | List of outstanding data requests (ID18) (no due date specified) by OHMIS service area (ID10)  |
| DL28                    | List of overdue data requests (ID18) by OHMIS service area (ID10)  |
| DL29                    | List of active (allowable limits specification) requirement application identifiers (ID5) by forms specification identifier (ID16) and OHMIS service area (ID10)   |
| DL30                    | List of active default (allowable limits specification) requirement application identifiers (ID5) by forms specification identifier (ID16) and OHMIS service area (ID10)   |
| DL31                    | List of task identifiers (ID23) for tasks that cannot be scheduled by OHMIS service area (ID10)  |
| DL32                    | List of the employee identifier (ID4) that is one of the requirement implementation units with the corresponding requirement application identifier (ID5) and OHMIS service area identifier (ID10), for those ID5s that identify requirement suspense data sets (DS4) that will trigger an 'employee transport' type of task |
| DL33                    | List of monthly schedule identifiers (ID27) by OHMIS service area (ID10)   |
| DL34                    | List of qualified employee identifiers (ID4) by task type (CT8) and by OHMIS service area (ID10)   |
| DL35                    | List of requirement implementation identifiers (ID9) for requirements having tasks that need to be scheduled by OHMIS service area (ID10)  |

FIGURE 6-4 (Cont'd.)

| <u>Data List Number</u> | <u>Data List Title</u>  |
|-------------------------|---|
| DL36                    | List of requirement implementation units (or sets of units) linked to their corresponding task identifier (ID23), OHMIS service area identifier (ID10) and whether the task is an 'employee transport' type of task   |
| DL37                    | List of the task identifier (ID23) by the main facility identifier (ID8) in which the task will take place and by its OHMIS service area (ID10)   |
| DL38                    | List of task identifiers (ID23) by requirement implementation identifier (ID9) and by OHMIS service area (ID10)   |
| DL39                    | List of task identifiers (ID23) for tasks that need to be rescheduled by OHMIS service area (ID10)  |
| DL40                    | List of weekly schedule identifiers (ID28) by employee identifier (ID4) and by OHMIS service area (ID10)  |
| DL41                    | List of the monthly schedule identifiers (ID27) for an OHMIS service area (ID10) with the corresponding year and month covered by the monthly schedule data (DS27) identified by the ID27 and the employee identifier (ID4) of the employee performing the task scheduled on this DS27 data |
| DL42                    | List of the contact identifier (ID26) by the identifier of the person or thing for which contact and location data (DS28) is provided, by OHMIS service area (ID10)   |
| DL43                    | List of weekly schedule identifiers (ID28) by contact identifiers (ID26) and by OHMIS service area (ID10)   |
| DL44:                   | Menu Selection Sequence by OHMIS user type code (CT1)   |

FIGURE 6-5

TITLES OF OUTPUTS

| <u>Output Number</u> | <u>Output Title</u>  |
|----------------------|--|
| 01                   | Requirements Check Notice  |
| 02                   | Outstanding Requirements Checks Needed List  |
| 03                   | Requirements Notification and Certification Record                                   |
| 04                   | Outstanding Requirements List (see DL3)  |
| 05                   | Reminder Notice List (see DL9)   |
| 06                   | Vacant Job Class List (see DL1)  |
| 07                   | Potential New Hire List (see D12)  |
| 08                   | New Hire List (see DL4)  |
| 09                   | Allowable Limits Check Notice  |
| 010                  | Outstanding Allowable Limits Checks Needed List                                      |
| 011                  | Allowable Limits Evaluation Summary  |
| 012                  | OHMIS 'Blank' Form (see Form Types) [Generic Description of All OHMIS 'Blank' Forms] |
| 013                  | Outstanding Data Requests List (see DL27 and DL28)                                   |
| 014                  | Daily Schedule   |
| 015                  | Scheduling Notice  |
| 016                  | Scheduled Task Description   |
| 017                  | List of Unscheduled Tasks  |

FIGURE 6-6

TITLES OF OHMIS CORE DATA PROCESSING FUNCTIONS

FUNCTION F1: User Transparent Functions

Function F1A: 'Log-on' Transparent Function

Function F1B: Triggering Step Transparent Function

FUNCTION F2: Requirements Functions

Function F2A: Requirements Check Function

Function F2B: Function for Entering Requirements Disposition Data

FUNCTION F3: OHMIS Forms Data Processing Functions

Function F3A: Generation of (Blank) Forms Functions

Function F3B: Completed Forms Data Entry and Allowable Limits Evaluation Function

Function F3C: Allowable Limits Check Function

Function F3D: Function for Canceling the Monitoring of Outstanding (uncompleted) OHMIS Forms

FUNCTION F4: Scheduling Functions

Function F4A: Scheduling Function

Function F4B: Rescheduling Function

Function F4C: Function for Routine Generation of Tentative Monthly Schedule Availability Data



The Functional Data Flows thus provide the IPOs for the core OHMIS data processing functions. A description of these core functions is provided in the Section below.

### 6.3 FOUR TYPES OF DATA IN THE OHMIS CORE DATA PROCESSING FUNCTIONS

In this Section each of the four basic types of data required to perform the assurance management functions of OHMIS are described.

As indicated in Section V, the overall assurance management function of OHMIS is to assure that the requirements for an Occupational Health Program are:

- 1) Triggered, i.e., the occasions in which the requirements apply are routinely identified by all levels of DA Occupational Health Program managers; and, are
- 2) Monitored, i.e., the implementation of the requirements are routinely monitored until complete and evaluated compared to DA performance criteria.

To achieve these two assurance management functions, OHMIS must contain the following generic types of information:

- 1) Specification for requirements, i.e., information on the exact nature and content of each requirement for the operation of the DA Occupational Health Program.
- 2) Specifications on the applicability of the requirements, i.e., information on the conditions or circumstances under which the requirements apply. The OHMIS data base must also contain information on the current status of the Occupational Health Program in order to determine if the current conditions or circumstances match those for which requirements apply, i.e., to determine if a requirement should be triggered.
- 3) Requirements implementation data, i.e., data to monitor the status of a requirement until it is executed and to store the history of requirements that have been implemented in order to audit the DA Occupational Health Program.
- 4) Scheduling data, i.e., data to schedule the execution of a task specified by a requirement that has been triggered.

Each of these four basic types of information are discussed below.

#### 6.3.1 OHMIS Requirements Data

In the OHMIS core data processing programs, a requirement for the DA Occupational Health Program defined in the OHMIS requirements (recommendations) description data set (DS1). Requirements are of many types. There will of course be many requirements based on OSHA-type

regulations. These requirements will include the corrective actions that must be taken to address specific hazards. There will also be requirements for monitoring hazards, e.g., the frequency of Industrial Hygiene Surveys, and for monitoring exposures to hazards, e.g., the frequency of medical surveillance. These types of requirements, based on regulations, have been discussed elsewhere in this report and are not reiterated here. Not all requirements in the OHMIS data base must be derived from regulations, however. Requirements can be either mandatory or recommended, i.e., based on best judgement, but not required in regulations.

Some types of requirements will be based on experience rather than regulations. For example, the investigation of a particular mishap, such as the spill of a hazardous substance, may result in corrective actions that are determined to apply to other circumstances. These then may become requirements that are initiated whenever the identified circumstances occur. One of the purposes of the OHMIS system is to capture these "lessons learned" from past experience and ensure that the lessons are applied in the future. Requirements can also be based on reviews of literature or on expert opinion. The OHMIS system does not stipulate that a requirement must be based on a regulation or that the corrective actions recommended in a requirement have proven effectiveness. The OHMIS requirement description data (DS1) provides for the storing of information on the source and rationale of a requirement or recommendation, including references to mishap reports, literature, regulations, special studies, etc. Some of the requirements entered into the OHMIS data base will be requirements to provide a certain type of data. For example, there may be a requirement to update a civilian employee's medical history data periodically, i.e., to update the data on diagnoses and treatments received outside of the DA medical service. These types of requirements for entering information into the OHMIS data base are included in the requirements data (DS1) for two purposes: to provide a means of triggering the actions needed for (i.e., to assure that):

- 1) The integrity of the OHMIS data base is maintained, i.e., assure that all needed data is entered, is current and that quality control checks for accuracy have been made; and
- 2) All information needed to determine the applicability of the requirement is obtained. For example, if there is a requirement that applies to an employee only if the employee is over age 50, then, in order to assure that the requirement is triggered whenever an employee with this characteristic is identified, the OHMIS data base must have a requirement specifying that the age of all employees be entered. The core OHMIS data processing functions provide for the identification of missing data elements and the 'automatic' generation of forms for collecting these missing values.

In the examples given above, all of the requirements specify that certain actions be undertaken, e.g., whenever a certain hazard is identified a certain (corrective) action is implemented. This is the

only type of requirement that is specified in the OHMIS requirements description data (DS1). There is, however, another type of requirement that specifies the content of an occupational health program activity. For example, a requirement that the medical examination for employees in certain job classes include a hearing test prescribes the content of the medical examination.

In the OHMIS core programs this type of nonaction requirement is called a content-specification requirement to distinguish it from the action-type requirement. Content-specification requirements are handled through Forms Description Data (DS10), rather than through requirements description data (DS1). In the forms description data (DS10) the OHMIS user prescribes the content of an OHMIS data entry form, i.e., what data element types be included in the form, and thereby prescribes the content of the OHMIS activity documented by the completion of that form. In the above example, the OHMIS user can specify the content of the occupational activity of conducting a routine medical exam by specifying the information that needs to be collected on the medical examination form used for this activity. Similarly, the requirements for the content of an Industrial Hygiene survey (e.g., what measurements are to be taken) can be prescribed by specifying the contents of the Industrial Hygiene survey form.

Normally, for a given occupational health activity there will be both requirements description data (DS1) and forms description data (DS10) covering both the action-type requirements and the content-specification type requirements. For example, the triggering of the action of undertaking a routine medical exam (i.e., the requirements for the frequency of medical surveillance) is accomplished through DS1 data as is the requirement for the action of using a specific sampling procedure in an Industrial Hygiene survey. Also, the DS1 data (and the corresponding task (action) type description data (DS23)) includes prescriptions for the type of OHMIS user/position that is to conduct an action, e.g., who is considered qualified to perform a medical exam or an Industrial Hygiene survey.

OHMIS requirements may be specified at any level ranging from the USAEHA to the local DA installation. However, in most instances, it will be the differences in the applicability of a requirement that will be determined at a local level, while the requirements themselves (including the specific contents of forms) will be prescribed at the DA level. The DS1 data includes a specification as to the type of organizational level at which the requirement is to apply, but it is up to each OHMIS service area to generate specific requirements applicability data that will trigger the implementation of the requirement in their OHMIS service area. The USAEHA, however, may review and modify the requirements applicability data specified at a local level at any time.

#### 6.3.2 Requirements Applicability Data: The OHMIS Requirement Triggering Mechanism

A fundamental assurance management function of the core OHMIS data processing program is to trigger action type requirements. That is, the OHMIS programs 'automatically':

- o Determine that the conditions or circumstances in which a requirement applies have occurred;
- o Notify the OHMIS user of the need for the requirement; and,
- o Generates the requirements implementation data (DS5) and the scheduling data needed to monitor the requirement until the user indicates that the requirement has been executed.

There are three ways in which a requirement may be triggered in the OHMIS system. The specifications for when a requirement is determined to be applicable (i.e., when it is to be triggered) for each of these three types of 'triggers' are given in three different types of requirements applicability data, named for the type of conditions or circumstances under which the requirement applicability data is used:

- 1) Information triggered requirements applicability data (DS3). This data set is used to trigger a requirement whenever a user executes a data processing step in the OHMIS program that has been designated as a triggering step. Whenever the user enters data onto the OHMIS data base using a data processing step that has been designated as a triggering step, the OHMIS triggering step program (Function F1B) compares the values entered or the previously entered values for the characteristics of the identifier entered during the triggering step with the value specified in the sets of DS3 data for the triggering step. If a match is found, the requirements specified in the matching DS3 data is triggered, i.e., requirements implementation data (DS5) for that requirement is generated.
- 2) Date triggered requirements applicability data (also called requirements suspense data) (DS4). This data set is used to trigger a requirement whenever a certain date (specified on the DS4 data) arrives. The DS4 data can specify either a specific due date, for one-time requirements, i.e., those that are to be implemented only once; or, an interval of time that will be used by the OHMIS program to generate a series of due dates (e.g., once every two years) for periodically triggered requirements, such as medical examinations and Industrial Hygiene surveys that are to be conducted more than once on a routine basis. The type of requirement triggering system specified in the DS4 data operates in a manner similar to a 'tickler' (or suspense) file system. Every day the OHMIS 'log on' program (Function F1A) checks to determine if the current date matches a due date specified in a set of DS4 data. If it does, the requirement specified in the DS4 data is generated.
- 3) Allowable limits specifications triggered requirements applicability data (DS17). This type of data set is used to specify an allowable limit for a given type of data element. Whenever data is entered onto the OHMIS data base from an OHMIS form (i.e., a form specified by the user on

forms description data (DS10)), the OHMIS completed forms data entry program (Function F3B) identifies the sets of DS17 data that are applicable. It then compares the values entered from the form with the specified values given for that data element type on each set of applicable DS17 data. If they match, the requirement given on the matching DS17 data is triggered.

In each of the above cases, the requirements applicability data triggers an action type requirement. That is a set of requirements implementation data (DS5) is generated when a requirement is triggered and this DS5 data is used to monitor the execution of the action specified by the requirement. For content-specification type requirements (based on the forms description data (DS10)), the applicability of the requirement is similar but determined in a different manner. When the OHMIS user wishes to generate a blank OHMIS form (i.e., Menu Selection Sequence 2.1.5) the OHMIS forms generation program (Function F3A) asks the user for the type of form (CT9) desired. The program then identifies what factors determine the applicability of the form using the forms applicability factors data (DS12) and asks the user for the values for these factors. For example, which medical examination form is applicable may depend on the job class of the employee being examined. In this case the job class would be an applicability factor determining which specification of the form should be used. When the user enters a value for the forms applicability factor (i.e., in the above example gives a job classification identifier), the program examines all sets of forms applicability values data (DS13) for the form type until a value is found that matches that entered by the user. The form specification identifier (ID16) given on the set of DS13 data which is found to match the value given by the user identifies the set of forms description data (DS10) that defines the version of the form that is to be used. The OHMIS program uses this set of DS10 data to generate the appropriate version of the form. The user is thus compelled to use the data entry form that meets the content-specification requirement, i.e., in this case the user is compelled to conduct the type of medical examination that has been determined through OHMIS policy (requirements) to be appropriate for the job class of the employee being examined.

### 6.3.3 Requirements Implementation Data

Each time an action type requirement is triggered by the OHMIS program, a set of requirements implementation data (DS5) is generated by the OHMIS program (i.e., the user does not enter DS5 data). The data describes the requirements to be implemented and identifies the requirement implementation unit for this execution of the requirement. The information describing the requirement is obtained from the requirements description data (DS1) that corresponds to the requirement identifier (ID6) given on the requirements applicability data (DS3, DS4, or DS17) that triggered the requirement. The requirement implementation unit is the person or thing about which a requirement is to be implemented. For example, if a set of DS4 data triggered a requirement to conduct an Industrial Hygiene survey in a given facility, the facility identifier for that facility would be the requirement

implementation unit for this execution of the requirement. The identification of the requirement implementation unit for a particular execution of a requirement is given in the triggering step requirement implementation unit identifier type data (DS6) for information triggered requirements (DS3); in the DS4 data triggering the requirement for date triggered requirements; and in the identification information on the form being entered (referred to as the forms unit information for the form) which contained the data element type for which an allowable limit was found to have been met, for allowable limits triggered requirements (DS17).

Each day as a part of the 'log-on' program (Function F1A), the OHMIS program informs the user of all outstanding (not executed) requirements using the Outstanding Requirements List (Output 04). The user employs the requirement implementation identifier (ID9) on this list to generate a detailed description of each outstanding requirement. This detailed description is given on the Requirements Notification Identification Record (Output 03). This document informs the user about the details of the requirement and provides a data entry space for entering information on the disposition of the requirement. There are four types of dispositions of requirements: 1) fully completed, 2) partially completed, 3) aborted (i.e., decided not to complete), and 4) determined to be not applicable for this particular execution of the requirement. The DS1 data on the requirement specifies what types of dispositions of a requirement are acceptable and what types of approvals of the disposition are required.

The information about the disposition of a requirement is stored on the requirements implementation data (DS5) for the requirement. Every effort has been made to design the OHMIS core programs to provide a mechanism for carefully documenting the implementation of requirements and for storing this information permanently. Historical DS5 data, i.e., DS5 data on the requirements that have already been executed, is maintained in the OHMIS data base. Provision is made for retaining the hard copy of the Requirements Notification and Certification Record for a requirement so that the signatures of those persons who executed and approved the execution of the requirement may be retained, if desired. It is not possible to delete a requirement from the Outstanding Requirements List (DL3; 04) or delete a task from the OHMIS monthly schedule of tasks (Output 014) without formal documentation of the disposition of the requirement. This formal documentation process is embodied into the OHMIS core data processing functions in order to provide an 'audit trail' for all DA Occupational Health Program activities. The OHMIS data base will provide a record of all hazards identified and decisions made about all corrective actions identified and implemented for these hazards. This will enable the type of epidemiological correlation studies mentioned previously, i.e., the correlation of medical events to the hazards to which employees are exposed and the corrective actions used for these hazards. More immediately, this documentation process enables each OHMIS service area to be routinely monitored for the specific tasks that are being executed as part of their Occupational Health Program. An evaluation can be made of the degree to which each OHMIS service area is following the guidelines for operation of a DA Occupational Health Program, i.e., the operating policies and goals specified in the OHMIS requirements.

#### 6.3.4 OHMIS Scheduling Data

As indicated above, requirement description data (DS1) describes action type requirements, i.e., requirements prescribing a particular task that should be undertaken in order to operate the DA Occupational Health Program according to the policies and goals specified by the Department of the Army. Many of these actions will be 'scheduleable' tasks, i.e., tasks for which it is possible to estimate the amount of time and the persons needed to perform the task. If the requirement is for a 'scheduleable task', a task type code (CT8) is given on the requirements description data (DS1). Whenever requirements corresponding to this DS1 data are triggered, i.e., whenever requirements implementation data (DS5) is generated for a requirement for which the requirements description data (DS1) specifies a task type code (CT8), the OHMIS scheduling program (Function F4A) schedules a task of the type specified in the DS1 data. For example, if a requirement to conduct a routine medical exam for an employee were triggered, the OHMIS scheduling program would automatically schedule this task as soon as the requirement has been triggered.

In order to automatically schedule tasks, the OHMIS core data base contains information on the availability of each OHMIS user/position who is available for scheduling for each day of the week. This data is contained in a regular weekly schedule availability data (DS26). Using the characteristics of the task type given on the task type description data (DS23) and the list of qualified employee identifiers by task type (DL34), the scheduling program determines the priority of each task and the persons available to perform the task and schedules the task accordingly. The schedule is stored on the monthly scheduled data (DS27). For those tasks requiring it, a Scheduling Notice (Output 015) is automatically generated for the task. This is sent by the OHMIS Data Processing staff person to the person participating in the task, e.g., the employee participating in the medical exam.

Every day as a part of the 'log-on' program (Function F1A) the program generates a Daily Schedule (Output 014) for each OHMIS user/position indicating the schedule of tasks for that user/position for that day. A scheduled task description (016) for each task is also generated. This output describes the task in detail. It is generated from the specific task scheduling data (DS24) for the task. Included on this output are problems with scheduling the task. This information can be used by each OHMIS service area to evaluate whether a change in the scheduling availability data (DS26) is warranted, i.e., whether the time resources allocated to each time of task on the DS26 data are adequate and consistent with the mix of tasks being triggered for the OHMIS service area.

The user indicates that a task has been completed by entering the requirement disposition data on the requirement for which the task was initiated (i.e., by completing the Requirements Notification and Certification Records (Output 03) and entering this disposition data onto the requirements implementation data (DS5) for the requirement). Only after this formal process of complying with requirement is the requirement removed from the schedule. Each day as a part of the 'log-on' function (Function F1A) the OHMIS program determines if more

than one week has passed since a task was scheduled for completion. If it has and the specific task scheduling data (DS24) for the task has not been deleted (i.e., the disposition data on the requirement which initiated the task has not been entered) the task is rescheduled (Function F4B).

#### 6.4 OHMIS CORE DATA PROCESSING FUNCTIONS

To summarize the above discussion, we will conclude by reviewing each of the 11 OHMIS core data processing functions listed in FIGURE 6-6. These 11 functions have been classed into 4 groups of Functions.

FUNCTION 1, the User Transparent Functions, provide for the processing of those functions that happen 'automatically' without the users initiation. These include Function F1A, the 'log-on' transparent function which is executed each time someone logs onto the OHMIS system. This function compares the current date with the due date triggered requirements applicability data (DS4) and triggers that all requirements that have come to by the current date. It also identifies which tasks need to be scheduled. Function F1A also generates the daily list of Outstanding Requirements (Output 04) and the Daily Schedule (014) as well as other routine data processing outputs, such as the list of outstanding data requests (Output 013) which tells the OHMIS service area which forms have been sent out and are due back.

Function F1B, the triggering step transparent function, executes the 'automatic' check for information triggered requirements (i.e., reviews the DS3 data) that occurs each time a user executes a triggering step in the OHMIS programs.

FUNCTION 2, the Requirement Functions, has three types of subfunctions. Function F2A, the requirements check function, provides a means for the user to execute a check for information triggered requirements, i.e., to check the DS3 data to determine if a requirement is applicable. This check is done whenever the current OHMIS data base does not have sufficient information to 'automatically' determine if an information triggered requirement is applicable. This would be the case, if the applicability factors provided in the DS3 data to determine whether or not a requirement is applicable were factors for which the current OHMIS data base does not have values. The user is notified daily on the Outstanding Requirements Checks Needed List (Output 02) (generated in Function F1A) of those requirements that require manual entry of values for the applicability factors in order to determine if requirements are applicable.

Function F2B, the function for entering requirements disposition data, provides the program for entering data on the execution of a requirement, i.e., the date and type of disposition on the requirement, who executed and approved the requirement, the location of further information on the execution of the requirement, etc. This data is entered onto the requirements implementation data (DS5) for the requirement. When this data is entered, Function F2B of the OHMIS program deletes the requirement from the outstanding requirements list (DL3; Output 04) and deletes the specific task scheduling data (DS24) on the task initiated by the requirement from the OHMIS data base.



FUNCTION 3, the OHMIS Forms Data Processing Function, includes three subfunctions. Function F3A, the generation of 'blank' forms function, uses the forms description data (DS10) to generate a form of the form type specified by the user that meets the forms applicability values specified by the user. This function identifies and implements the content-specification type of requirements for the OHMIS program. Output 02 provides a generic description of all OHMIS blank forms.

Function F3B, the completed forms data entry and allowable limits evaluation function, provides a means for the user to enter data from an OHMIS form, i.e., to enter the completed forms data generically defined for all forms in the DS14 data set. This function also 'automatically' evaluates the data entered on the OHMIS forms to determine if it matches the allowable limits specified in the DS17 data and triggers the applicable requirements implementation data (DS5) for those requirements specified in sets of DS17 data for which allowable limit were to found to match.

Function F3C, the allowable limit check function, provides a means for the user to manually check for requirements triggered by allowable limits specifications. As with the requirements check function (Function F2A), this function is used when the current OHMIS data base does not have sufficient information in it about the factors determining the applicability of allowable limits for the OHMIS allowable limits evaluation program (Function F3B) to 'automatically' determine whether there are applicable allowable limits. This function is also executed when it is possible to identify the applicable allowable limits specifications, but these specifications are such that they cannot be described in one of the many formats for describing allowable limits given in the DS17 data. Therefore, these allowable limits require a manual evaluation by the user to determine if the allowable limit has been met. As with the requirements check function, the user is notified of the need for an allowable limits check by the Outstanding Allowable Limits Checks Needed List (Output 010) generated each day as a part of the 'log on' program (Function F1A).

Function F3D, the function canceling the monitoring of outstanding (uncompleted) OHMIS forms, allows the user to indicate that a form that has been generated and sent out for completion is not going to be returned. This removes the form from the Outstanding Data Requests List (Output 013; DL26, DL27, and DL28).

FUNCTION F4, the Scheduling Function, provides for the scheduling (Function F4A) and the rescheduling (Function F4B) of tasks that correspond to the requirements triggered by the requirements applicability data. Function F4C provides for the automatic generation of a set of monthly schedule data (DS27) from the regular weekly schedule availability data (DS26). This DS27 data indicates the time slots tentatively available for scheduling for the month. The OHMIS program ensures that existing DS27 data always includes data for all OHMIS users for at least two months in advance of the current date.

FIGURE 6-7 (shown on the following six pages) provides a basic flow diagram of the core OHMIS data processing functions. This FIGURE shows how each function is integrated into the Menu Selection Sequences. As indicated above, the Menu Selection Sequences that are no more than input of Data Sets or generation of standard outputs are not separately described as functions in this report. The programs for these functions consist only of input and output of the data elements described in detail in Section 6.6 (Data Sets (Outputs)) and Section 6.7 (Inputs), respectively. These Sections follow the detailed description of the Menu Selection Sequences given in Section 6.5. Section 6.8 provides the Functional Data Flows for each of the 11 core OHMIS data processing functions.

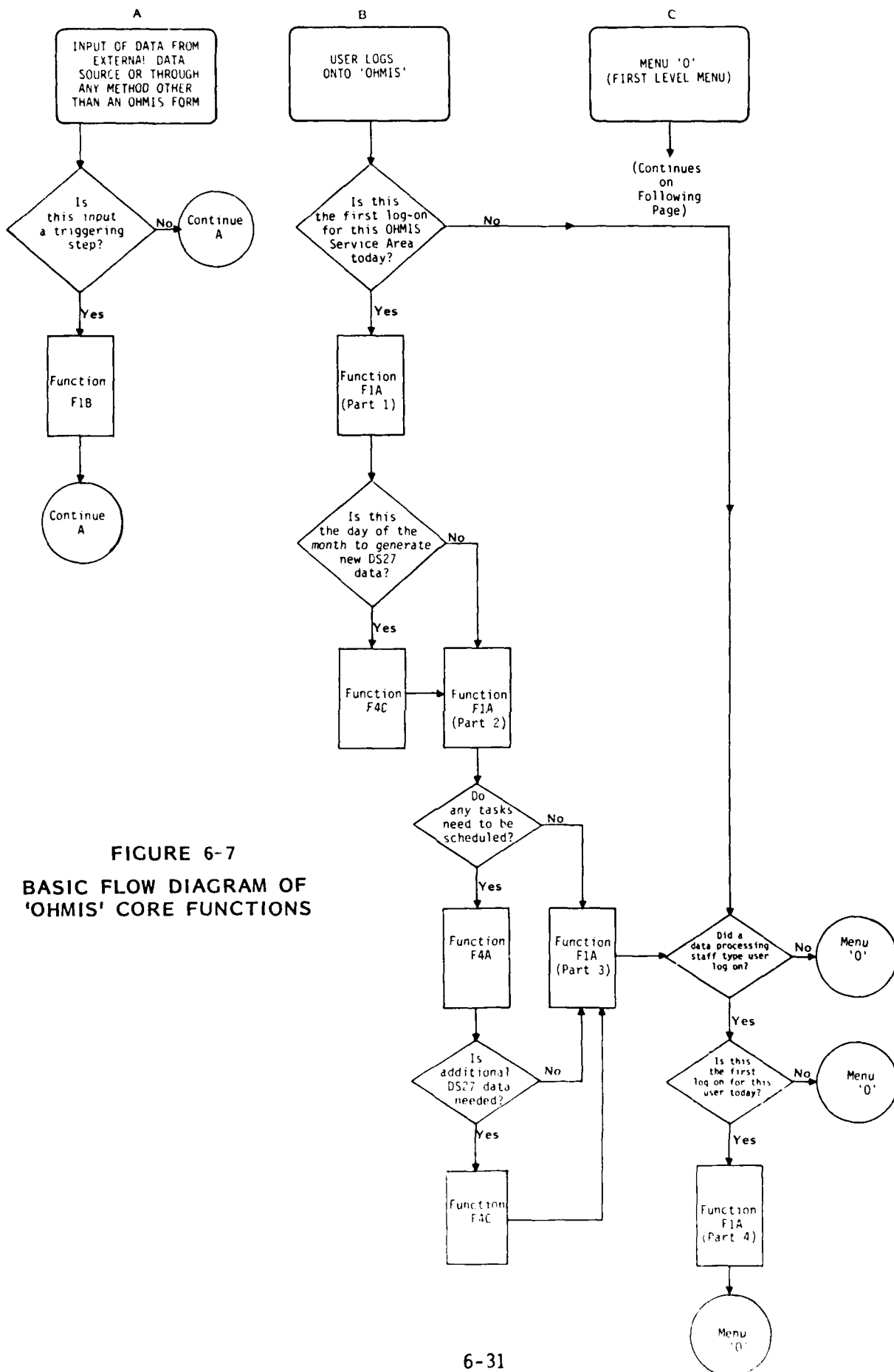


FIGURE 6-7  
BASIC FLOW DIAGRAM OF  
'OHMIS' CORE FUNCTIONS

FIGURE 6-7 (Cont'd.)

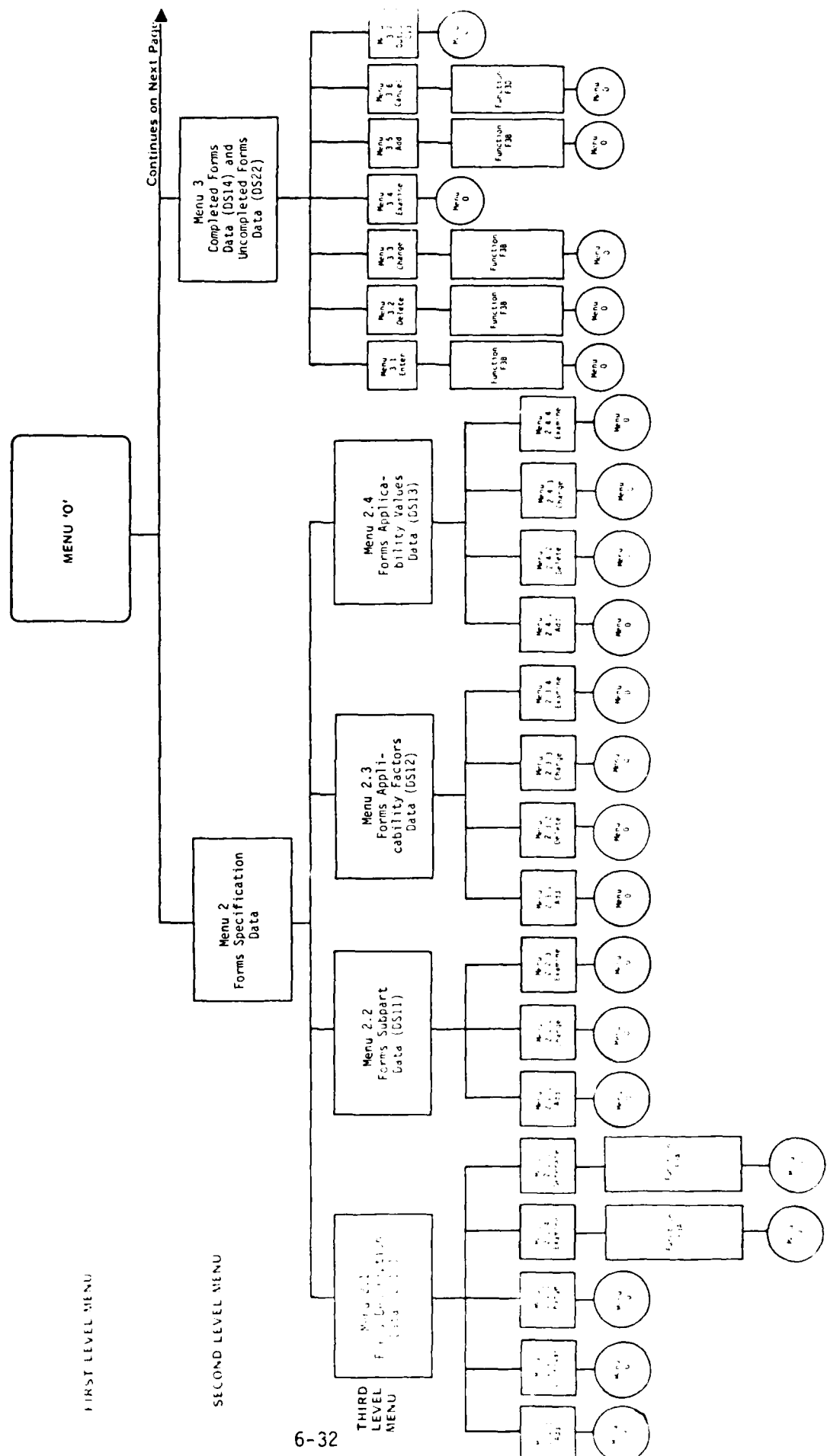


FIGURE 6-7 (Cont'd.)

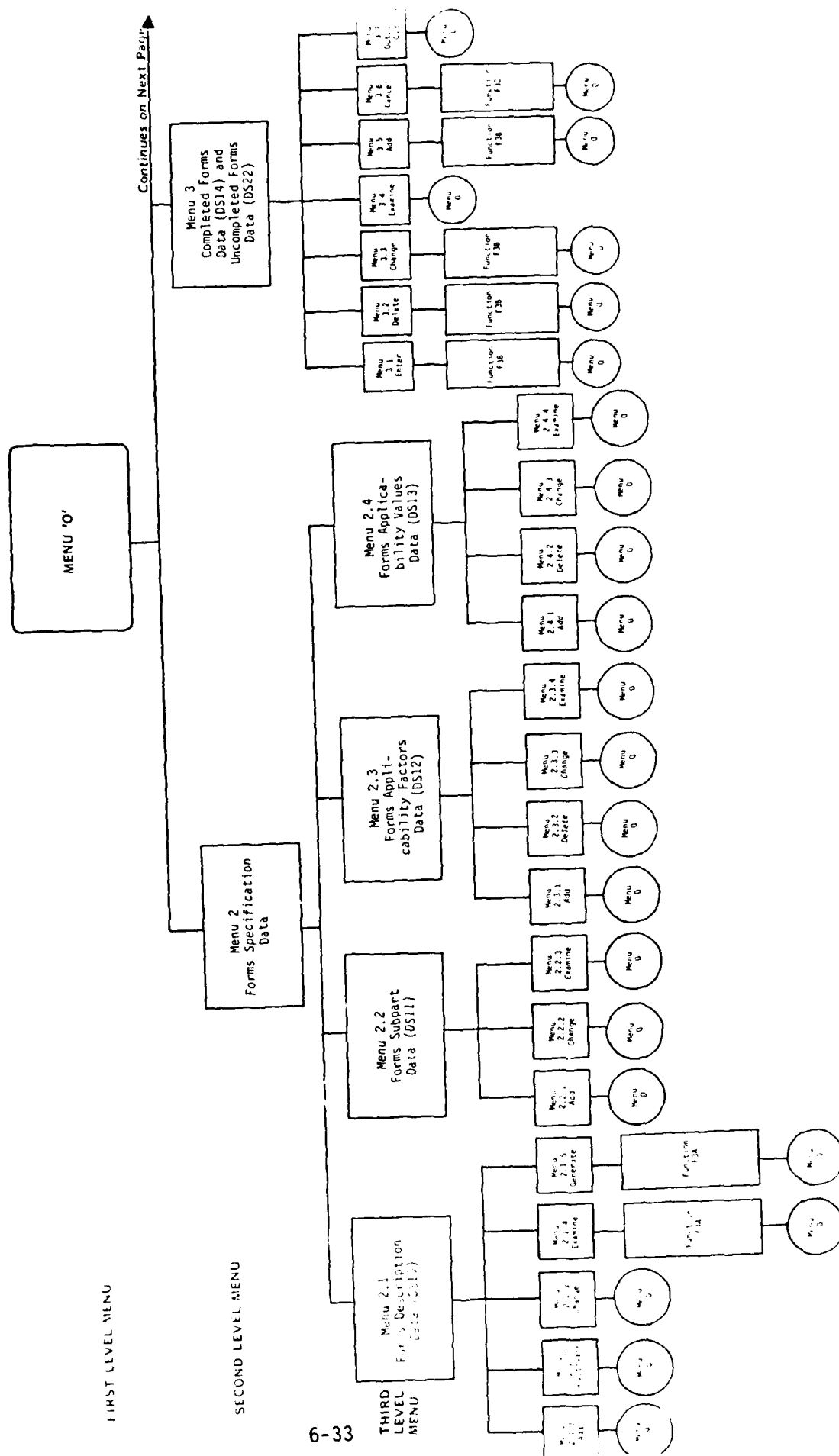


FIGURE 6-7 (cont'd.)

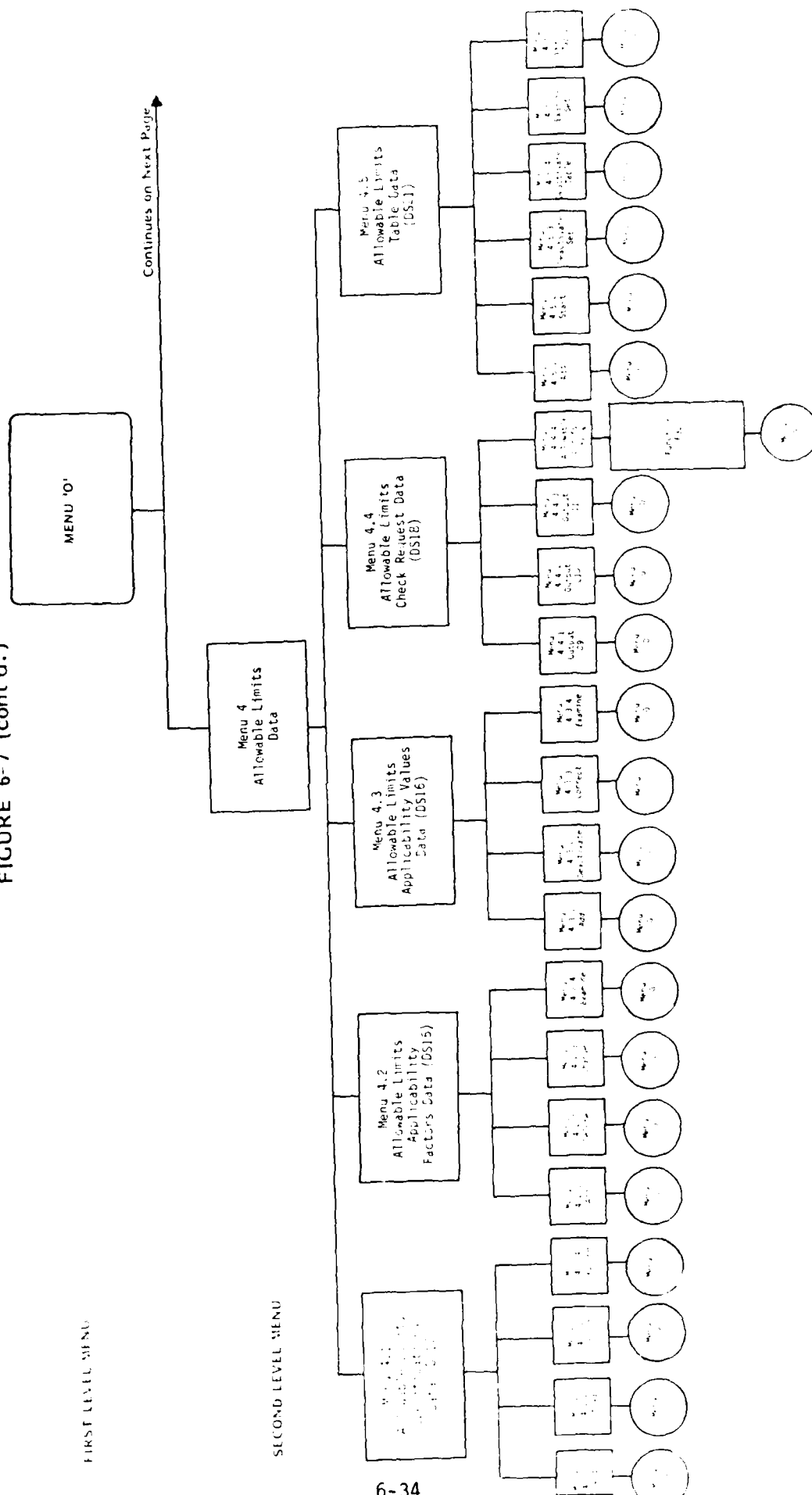
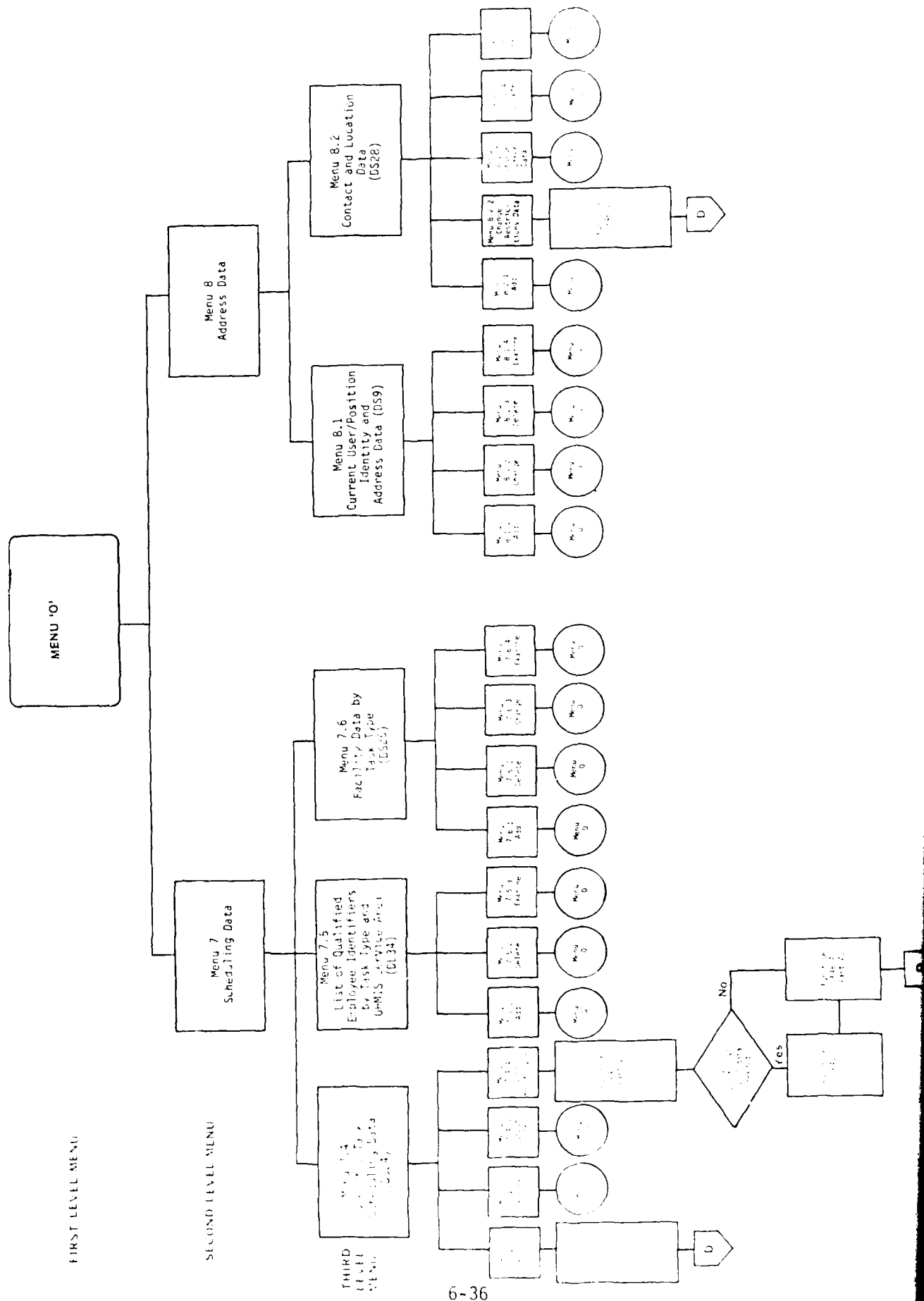




FIGURE 6-7 (Cont'd.)





## 6.5 MENU SELECTION SEQUENCES

The following are the Menu Selection Sequences used to allow the user to input or request outputs from the core OHMIS programs.

MENU 0 (First Level Menu)

Please select the basic type of data you wish to use:

- 1 = OHMIS requirements data (includes requirements suspense and  
Reminder Notice Data)
- 2 = Forms description data
- 3 = Completed forms data (DS14) and uncompleted forms data  
(DS22)
- 4 = Allowable limits data
- 5 = Type code (vocabulary word/phrase) data
- 6 = Time period specification data (DS20)
- 7 = Scheduling data
- 8 = Address data

MENU 1 (Second Level Menu)

Please indicate the specific type of requirements data you wish to use:

- 1 = OHMIS requirement (recommendation) description data (DS1)
- 2 = Requirements check request data (DS2)
- 3 = (Information triggered) requirements applicability data (DS3)
- 4 = Requirements suspense data (i.e., date triggered requirements applicability data), including entering data on "reminders", i.e., date triggered Reminder Notices that are not requirements (DS4)
- 5 = Requirements implementation data (DS5), includes generating Notices about requirements and entering requirements disposition data

### MENU 1.1 (Third Level Menu)

Please indicate how you wish to use the OHMIS requirement (recommendation) description data (DS1):

- 1 = Add a requirement description
- 2 = Examine a requirement description
- 3 = Correct a requirement description. Requirement descriptions cannot be changed or deleted. If the requirement has changed, deactivate the old requirement (Selection 4) and add a new requirement (Selection 1). Menu Selection 3 should only be used if the requirement description was never correct at any time, e.g., to correct a typographical error or fill in missing information. For this reason only descriptive information can be changed and blank information filled in using this Menu Selection. If nondescriptive information is incorrect, deactivate the incorrect requirement description data and generate a new requirement description with the correct information. [Note: Descriptive information is data elements such as instructions or explanations; the user will be allowed to change only limited data elements and these will not include the description of the requirement, in order to ensure that an audit trail of requirements is maintained throughout the history of OHMIS.]
- 4 = Deactivate a requirement. This Menu Selection should only be used if it has been determined that an existing requirement should not be used any longer. If the use of the requirements is still acceptable, but is no longer applicable, then Select the requirement applicability data Menu Selections (Menus 1.2, 1.3 and 4.1) to deactivate the application of the requirement.

MENU 1.2 (Third Level Menu)

Please indicate how you wish to use the Requirements Check Request Data (DS2):

- 1 = Generate a Requirements Check Notice (Output 01)
- 2 = Generate an Outstanding Requirements Checks Needed List (Output 02)
- 3 = Conduct a requirements check (See Function F2A)

### MENU 1.3 (Third Level Menu)

Please indicate how you wish to use the information triggered requirements applicability data (DS3):

- 1 = Add a new set of information triggered requirements applicability data
- 2 = Examine information triggered requirements applicability data
- 3 = Correct the narrative portions of a set of information triggered requirements applicability data. Applicability data cannot be changed or deleted. If the application has changed, deactivate the old applicability data and add new applicability data. Menu Selection 3 should only be used if the applicability data was never correct at any time, e.g., to correct a typographical error or fill in missing information.
- 4 = Deactivate a set of requirements applicability data. Use this Menu Selection to provide the 'end date' for an application of a requirement.

#### MENU 1.4 (Third Level Menu)

Please indicate how you wish to use the requirements suspense data (DS4):

- 1 = Add a new set of requirements suspense data (or add a new Reminder Notice)
- 2 = Examine requirements suspense data
- 3 = Correct the narrative portions of the data for a set of requirements suspense data. With the exception of Reminder Notice type of requirements suspense data, requirements suspense data cannot be deleted or changed. If the data has changed, deactivate the old data and add new data. Menu Selection 3 is only to be used to correct requirements suspense data, i.e., change narrative data that was never corrected any time, such as typographical entries.
- 4 = Cancel (deactivate) a set of requirements suspense data. This Menu Selection is used to stop the triggering function of a set of requirements suspense data before the 'last suspense date' on the data has been reached. If canceling Reminder Notice type of requirements suspense data, the entry of a deactivation date will delete the requirements suspense data from the OHMIS data base. This Menu Selection is also used to supply an end date for a set of requirements suspense data that had no such date defined.

MENU 1.5 (Third Level Menu)

Please indicate how you wish to use the requirements implementation data (DS5):

- 1 = Generate a Requirement Notification and Certification Record (Output 03)
- 2 = Generate an Outstanding Requirements List (Output 04)
- 3 = Enter requirements disposition data for a particular implementation of a requirement, i.e., enter information about who executed a requirement, when a requirement was executed and in what way. (See Function F2B.)
- 4 = Generate a Reminder Notice List (Output 05)
- 5 = Change requirements disposition data



MENU 2 (Second Level Menu)

Please indicate the specific type of forms specification data you wish to use:

- 1 = Forms description data (DS10), includes generation of forms
- 2 = Forms subpart data (DS11)
- 3 = Forms applicability factors data (DS12)
- 4 = Forms applicability values data (DS13)

MENU 2.1 (Third Level Menu)

Please indicate how you wish to use the forms description data  
(DS10):

- 1 = Add a new set of forms description data, i.e., specify the design for a new version of a form
- 2 = Deactivate forms description data
- 3 = Change the narrative (i.e., nonforms subpart identifier) portions of the forms description data, e.g., titles and instruction data
- 4 = Examine forms description data (see Function F3A)
- 5 = Generate a form for use in data entry. Includes generating a previously generated blank form (i.e., one with identification information on it). The contents of which has not yet been completed. (See Function F3A.)

MENU 2.2 (Third Level Menu)

Please indicate how you wish to use the forms subpart data (DS11):

- 1 = Add new forms subpart data
- 2 = Change the narrative (nondata element type) portion of the forms subpart data (e.g., subtitles and instructions)
- 3 = Examine forms subpart data

MENU 2.3 (Third Level Menu)

Please indicate how you wish to use the forms applicability factors data (DS12):

- 1 = Add new forms applicability factors data
- 2 = Delete forms applicability factors data
- 3 = Change forms applicability factors data
- 4 = Examine forms applicability factors data

MENU 2.4 (Third Level Menu)

Please indicate how you wish to use the forms applicability values data (DS13):

- 1 = Add new forms applicability values data
- 2 = Delete forms applicability values data
- 3 = Change forms applicability values data
- 4 = Examine forms applicability values data

MENU 3 (Second Level Menu)

Please indicate how you wish to use the completed forms data (DS14)  
and uncompleted forms data (DS22):

- 1 = Enter data from a form (see Function F3B)
- 2 = Delete the entire completed forms data (see Step 6 of Function F3B)
- 3 = Change completed forms data (see Function F3B, except no need to look for Data Element Sequence Numbers or base line information, i.e., Steps 4 through 7 of Function F3B. If the change to a completed data element type is to complete the value for the data element type from the completed forms data, see Step 7 of Function F3B).
- 4 = Examine a completed form
- 5 = Add missing data element information on a previously completed forms data set (see Step 7 of Function F3B)
- 6 = Cancel an outstanding (uncompleted) form, i.e., indicate that an outstanding form is not going to be submitted (see Function 3D)
- 7 = Generate an Outstanding Data Requests List (Output 013)

#### MENU 4 (Second Level Menu)

Please indicate the specific type of allowable limits data you wish to use:

- 1 = Allowable limits specification data (DS17)
- 2 = Allowable limits applicability factors data (DS15)
- 3 = Allowable limits applicability values data (DS16)
- 4 = Allowable limits check request data (DS18)
- 5 = Allowable limits check table data (DS21)

MENU 4.1 (Third Level Menu)

Please indicate how you wish to use the allowable limits specification data (DS17):

- 1 = Add new allowable limits specification data
- 2 = Deactivate existing allowable limits specification data
- 3 = Correct the narrative portions of the allowable limits specification data. Note: Allowable limits specification data cannot be changed or deleted. If the data is incorrect in parts other than the narrative portions of the data set, deactivate the incorrect data set and add a new data set with the correct values.
- 4 = Examine allowable limits specification data



MENU 4.2 (Third Level Menu)

Please indicate how you wish to use the allowable limits applicability factors data (DS15):

- 1 = Add new allowable limits applicability factors data
- 2 = Delete allowable limits applicability factors data
- 3 = Change allowable limits applicability factors data
- 4 = Examine allowable limits applicability factors data

#### MENU 4.3 (Third Level Menu)

Please indicate how you wish to use the allowable limits applicability values data (DS16):

- 1 = Add new allowable limits applicability values data
- 2 = Deactivate existing allowable limits applicability values data
- 3 = Correct narrative portions of the allowable limits applicability values data, i.e., change the descriptive, but not the values portion of the data. Allowable limits applicability values data cannot be deleted or changed.
- 4 = Examine allowable limits applicability values data

MENU 4.4 (Third Level Menu)

Please indicate how you wish to use the allowable limits check request data (DS18):

- 1 = Generate an Allowable Limits Check Notice (Output 09)
- 2 = Generate an Outstanding Allowable Limits Checks Needed List (Output 10)
- 3 = Generate an Allowable Limits Evaluation Summary (Output 011)
- 4 = Conduct an allowable limits check (see Function F3C)

#### MENU 4.5 (Third Level Menu)

Please indicate how you wish to use the allowable limits table data (DS21):

- 1 = Add a set of allowable limits to an existing allowable limits table (user will specify the allowable limit table identifier (ID25))
- 2 = Start a new allowable limits table
- 3 = Deactivate a set of allowable limits table data
- 4 = Deactivate an entire allowable limits table
- 5 = Examine an allowable limits table data set
- 6 = Examine an entire allowable limits table

## MENU 5 (Second Level Menu)

Please indicate how you wish to use the type code (CT) (vocabulary word/phrase) data:

- 1 = Add a new type code
- 2 = Correct the narrative description portion of the type code data, not the type code itself
- 3 = Examine type codes

(In the entry program the user will specify the type of type code, e.g., requirement type code (CT3) that the user wishes to enter; in the correction program the user will specify a particular type code; in the examination program the user may specify a type of type code or a particular type code.)

NOTE: Menu Selection Sequences 5.1 and 5.2 will have very limited access. Most OHMIS users will not be able to add or correct vocabulary words. The vocabulary words include the generation of Data Set 7 data (Data Element Type Information).

MENU 6 (Second level Menu)

Please specify how you would like to use the time period  
specification data (DS20):

- 1 = Add new time period specification data
- 2 = Examine time period specification data

MENU 7 (Second Level Menu)

Please indicate the specific type of scheduling data you wish to use:

- 1 = Task type data (DS23)
- 2 = Regular weekly schedule of availability data (DS26)
- 3 = Monthly schedule data (DS27)
- 4 = Specific task scheduling data (DS24)
- 5 = List of qualified employee identifiers by task type and by OHMIS service area (DL34)
- 6 = Facility data by task type (DS25)

### MENU 7.1 (Third Level Menu)

Please indicate how you wish to use the task type data (DS23):

- 1 = Add new task type
- 2 = Correct the description (narrative) portions of the task type data. This would include correcting only those data elements in the DS23 data set that are not affected by any other data, specifically those not used in the specific task scheduling data (DS24). Typographical errors in the description of the task are the main type of corrections. If other types of corrections or changes are desired, the user must generate new task type data. Task type data cannot be changed or deleted. This type of data can also not be deactivated. Task type data is treated as though it were a vocabulary word that must remain in the system throughout the history of the system.
- 3 = Examine task type data



MENU 7.2 (Third Level Menu)

Please indicate how you wish to use regular weekly schedule data  
(DS26):

- 1 = Add regular weekly schedule data
- 2 = Provide a deactivation (end) date for regular weekly  
schedule data (see Function F4B). The DS26 data will be  
deleted when the deactivation date is reached.
- 3 = Change the regular weekly schedule data (see Function F4B)
- 4 = Examine the regular weekly schedule data

### MENU 7.3 (Third Level Menu)

Please indicate how you wish to use the monthly schedule data (DS27):

- 1 = Delete the monthly schedule data. (See Menu Selection Sequence 7.2.2 (deactivate regular weekly schedule data); use this method to delete monthly schedule data.)
- 2 = Change the monthly schedule data (see Function F4B); only the availability data and preferred time use on the DS27 data can be changed; to change a schedule, the DS24 data (Menu Selection Sequence 7.4.1) must be changed.
- 3 = Examine the monthly schedule data
- 4 = Generate a Daily Schedule (Output 014)
- 5 = Generate a Scheduling Notice (Output 015) for the task. (Note: Unlike the Scheduling Notice 015 that is generated automatically for the task when the task is scheduled in Function F4A, the name of the person to whom the Notice is to be sent is specified by the user, rather than automatically determined by the program.)
- 6 = Generate a List of Unscheduled Tasks (Output 017)
- 7 = Generate a "blank" set of monthly schedule data, i.e., DS27 data with only availability and preferred time use (CT11) on it, no tasks scheduled on it. (See Function F4C.)

#### MENU 7.4 (Third Level Menu)

Please indicate how you wish to use the specific task scheduling data (DS24):

- 1 = Change portions of a specific task scheduling data. (Note: The DS24 data is generated by the OHMIS program (Function F4A) whenever requirement implementation data (DS5) is generated, using the task type description data (DS23). The user may change only selected items on the DS24 data. See Menu Selection Sequence 7.4.4. Some of these changes may result in rescheduling (Function F4B).
- 2 = Examine the specific task scheduling data
- 3 = Generate a Scheduled Task Description (Output 016)
- 4 = Specify the reschedule for a task, includes specifying that additional person(s) should be scheduled to perform an already scheduled task (see Function F4B)

MENU 7.5 (Third Level Menu)

Please indicate how you wish to use the list of qualified employee identifiers by task type and by OHMIS service area (DL34):

- 1 = Add a new employee identifier (ID4) to the list
- 2 = Delete an employee identifier (ID4) from the list
- 3 = Examine the list for an OHMIS service area

MENU 7.6 (Third Level Menu)

Please indicate how you wish to use the facility data by task type  
(DS25):

- 1 = Add new facility data by task type
- 2 = Delete a set of facility data by task type
- 3 = Change a set of facility data by task type
- 4 = Examine a set of facility data by task type

MENU 8 (Second Level Menu)

Please indicate the specific type of address data you wish to use:

- 1 = Current user/position identity and address data (DS9)
- 2 = Contact and location data (DS28)

MENU 8.1 (Third Level Menu)

Please indicate how you wish to use the current user/position  
identity and address data:

- 1 = Add data
- 2 = Change data
- 3 = Delete data
- 4 = Examine data

MENU 8.2 (Third Level Menu)

Please indicate how you wish to use the contact and location data  
(DS28):

- 1 = Add new contact and location data
- 2 = Change the task scheduling restrictions information on the  
contact and location data (see Function F4B)
- 3 = Change other parts of the contact and location data
- 4 = Delete contact and location data
- 5 = Examine contact and location data



#### 6.6 DATA SETS (INPUTS)

The following are the descriptions of the Data Sets that are used in the Functional Data Flows describing the core OHMIS data processing functions. Data Sets can be considered inputs to the OHMIS data base.

## TITLES OF DATA SETS

| <u>Data Set Number</u> | <u>Data Set Title</u>   |
|------------------------|---|
| DS1                    | OHMIS requirement (recommendation) description data (see ID6)   |
| DS2                    | Requirements check request data (see ID1)   |
| DS3                    | (Information triggered) requirements applicability data (see ID5)   |
| DS4                    | Requirements suspense data (i.e., date triggered requirements applicability data), including reminder notice data (see ID5) |
| DS5                    | Requirements implementation data (see ID9)  |
| DS6                    | Triggering step requirement implementation unit identifier types data   |
| DS7                    | Data element type information   |
| DS8                    | Values data for requirement applicability characteristics   |
| DS9                    | Current user/position identity and address data   |
| DS10                   | Forms description data (see ID16)   |
| DS11                   | Forms subpart data (see ID17)   |
| DS12                   | Forms applicability factors data  |
| DS13                   | Forms applicability values data (see ID19)  |
| DS14                   | Completed forms data (see ID18) [generic description]   |
| DS15                   | Allowable limits applicability factors data   |
| DS16                   | Allowable limits applicability values data (see ID20)   |
| DS17                   | Allowable limits specification data (see ID5)   |
| DS18                   | Allowable limits check request data (see ID22)  |

Data Set NumberData Set Title

|      |  |
|------|--|
| DS19 | Missing data element information (see ID21 and DL25) |
| DS20 | Time period specification data (see ID24).           |
| DS21 | Allowable limits table data (see ID25)               |
| DS22 | Outstanding (uncompleted) forms monitoring data      |
| DS23 | Task description data (see CT8)                      |
| DS24 | Specific task scheduling data (see ID23)             |
| DS25 | Facility data by task type (CT8)                     |
| DS26 | Regular weekly schedule availability data (see ID28) |
| DS27 | Monthly schedule data (availability and use)         |
| DS28 | Contact and location data (see ID26)                 |

## DATA SET 1

### OHMIS Requirement (Recommendation) Description Data

This data describes the characteristics of a particular requirement (or recommendation). DS1 data is entered by selected users (those having the correct password) using Menu Selection Sequence 1.1.1. This data cannot be deleted or changed.

The DS1 data is referenced in the requirements applicability data (DS3), requirement suspense data (DS4), and the allowable limits specification data (DS17), all of which prescribe when the implementation of this requirement is to be triggered (i.e., when this requirement is applicable). When a set of DS3 data identifying a requirement is found to be applicable (following the execution of a triggering step; Function 1B); or when a due date for a requirement specified in a set of DS4 data comes due (following a suspense check; part of Function F1A); or, when a data entry from an OHMIS form is found to match an allowable limit specified in DS17 data and, therefore, triggers a requirement, it is the information on the requirement given in the DS1 data that is used to implement the requirement. To implement a requirement, the OHMIS program generates a set of requirements implementation data (DS5) using the DS3, DS4, or DS17 data that triggered the requirement and the referenced DS1 data to supply the data elements for the generation of the DS5 data set.

For some types of requirements that are triggered by information triggered requirements applicability data (DS3) or allowable limits specifications requirements applicability data (DS17), the requirement will be to implement another requirement at a later date or to implement another requirement more than once (periodically triggered requirements). For example, the entry of data that is found to match the allowable limits specified in a set of DS17 data may not only trigger a requirement to identify a corrective action, but may also trigger a requirement to follow up on the implementation of the corrective action within 30 days (i.e., trigger another requirement at a later date). Another example would be a requirement triggered by a set of DS3 data linked to the entry of an employee identifier (ID4) onto the new hire list (DL4) (when this entry had previously been identified as a triggering step). This DS3 data might require setting up suspense data (DS4) to periodically trigger a routine medical surveillance examination for the new employee that was entered onto the new hire list (i.e., a requirement to trigger another requirement more than once).

This type of requirement that triggers other requirements is called a 'suspense applicability data generating requirement'. When the DS3 data or DS17 data triggers such a requirement, i.e., when it is found that a suspense applicability data generating requirement is applicable, the OHMIS program does not generate requirements implementation data (DS5) as usual, but instead generates a new set of requirements suspense data (DS4) which in turn will trigger the specified requirements implementation data (DS5) when (or each time) the due date on the newly created DS4 data comes due.

## DATA SET 1

Thus, in the first example given above, when the DS17 data found that the requirement for a follow-up in 30 days was applicable, the OHMIS program would not generate a set of DS5 data, but would generate a set of DS4 data specifying that another requirement (i.e., the requirement for the follow-up action) is to be triggered in 30 days. In 30 days, when the OHMIS suspense check program (Function 1A) compares the current date with the 'first suspense date' on the newly created DS4 data and finds that the requirement has come due, the requirements implementation data (DS5) for the follow-up requirement would be generated. Similarly, in the second example given above, when the program (Function F1B) found that the requirement specified in the DS3 data (i.e., to set up a routine medical surveillance schedule for the new employee) was applicable, the OHMIS program would generate a set of periodically triggered DS4 data that would in turn generate the DS5 data every time that the due date for routine medical surveillance comes due.

DS1 data for suspense applicability data generating requirements is entered by the user in the same way as other requirements description data (DS1). The only difference is that the DS1 data entered for a suspense applicability data generating requirement is the DS1 data that will be referenced in the DS4 data that is generated by this DS1 and is the DS1 data that will be used in the generation of the DS5 data triggered by that set of DS4 data. For example, when a brief description of the requirement is entered for the DS1 data, it will be the description of the requirement that this DS1 data is triggering, not the requirement itself. In the above example, this would mean that the requirement description would be "take follow-up action on a correction action identified 30 days previous" (not "schedule follow-up action for 30 days from now"); or in the second example "conduct medical surveillance" (not "schedule medical surveillance"). Similarly, some of the fields on the DS4 data that is to be generated by this requirement are supplied by the DS3 data or DS17 data that triggered this requirement.

Note: The OHMIS program only checks to determine if a set of DS1 data is a 'suspense applicability data generating requirement', when the requirement (DS1) is found to be applicable using DS3 or DS17 requirements applicability data, not when it is found to be applicable using DS4 (suspense type) requirements applicability data. Therefore, when the DS4 data generated by a suspense applicability data generating requirement shows that the requirement has come due, it will not use the DS1 data to generate DS4 data again (as was done when the DS3 data or DS17 data that found the requirement to be applicable was what triggered the requirement), but will generate the requirements implementation data (DS5) as is done for any other non-suspense applicability data generating requirement. Because of this, it is possible to use the data from a 'suspense applicability data generating requirement' type of DS1 data as both the data to generate a set of DS4 data (when the DS1 data is triggered by either DS3 or DS17 data) and the data to generate the DS5 data (when, at a later date, the requirement specified in the DS1 data is triggered by the DS4 data previously generated by the DS1 data).

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1. OHMIS requirement identifier (ID6). Unique value assigned by the program to distinguish this set of DS1 data.
2. OHMIS requirement type code (CT3) indicating what type of requirement is being described in this DS1 data.
3. Is this a 'suspense applicability data generating requirement'? Answer: Yes/No.
4. If this is a suspense applicability data generating requirement, the brief description of the type of DS4 data that will be generated by this requirement, e.g., "this requirement will generate the suspense data that will in turn trigger a follow-up on corrective actions in 30 days". This is the only data element on the DS1 data for a suspense applicability data generating requirement that is related to the actual requirement of generating suspense applicability data. The rest of the information on the DS1 data relates to the requirement that is to be triggered by the suspense applicability data (DS4) that is generated by this set of 'suspense applicability data generating requirement' type of DS1 data, or, is used to generate the DS4 data.
5. If this is a suspense applicability data generating requirement, whether the DS4 data generated by this requirement will be implemented more than once. Answer: Yes (the DS4 data generated should be a DS4 data set for a periodically triggered requirement) or No (the DS4 data generated should be for a one-time triggered requirement).
6. If this is a suspense applicability data generating requirement, the amount of time in days from the date that the requirement was found to be applicable and the DS4 data is generated to the 'first suspense date'. This information is used to calculate the 'first suspense date' that will be entered on the DS4 data that is generated from this requirement.
7. If this is a suspense applicability data generating requirement, the amount of time in days that is to constitute the 'prior notification time' on the DS4 data that is to be generated.
8. Brief description of this requirement. Used on the Outstanding Requirements List (04).
9. Detailed description of this requirement. Used on the Requirement Notification and Certification Record (03).
10. Task type code (CT8) for the type of action specified by this requirement. Used in scheduling the execution of this requirement.

## DATA SET 1

This field may be blank if there is no "scheduleable" task associated with this requirement. A "unscheduleable" task is one for which the hours and type of personnel required for the task are either too small to schedule, involve time of persons other than the OHMIS users or persons filling OHMIS positions and therefore cannot be scheduled, or are too ill-defined to enable the generation of the data needed to 'automatically' schedule the task, i.e., generate specific task scheduling data (DS24). Examples of requirements that specify unscheduleable tasks include a requirement such as "notify the facility superintendent of condition X" or "obtain past medical records for the employee" (tasks that are too small to schedule); or, "evaluate the need for additional corrective actions" (a task too ill-defined to schedule). Such tasks are only described in the 'detailed description of the requirement' field on the DS1 data and are not given a task type code (CT8) for scheduling.

Because the determination of who is to execute an OHMIS requirement (recommendation) is based in large part on the type of task (CT8) involved in the requirement, if no CT8 is given in this field, there are special checks needed for the data in the 'person who should execute' field given on the DS1, DS3, DS4, DS17, DS23, and DS24 data sets.

11. Description of the Menu Selection Sequence needed for undertaking the data processing actions of this requirement. May be left blank if none are specified.
12. Whether or not this is a mandatory requirement or a recommendation. Note: Mandatory requirements need approval for any disposition of the implementation of this requirement other than "fully completed." (See "disposition approvals" data element below.)
13. Organizational level type code (CT5) for the type of organizational level at which this requirement is to be applied, e.g., this requirement is to be applied by (i.e. applied for one or more) OHMIS service areas, organizational units, job classes, installations, or facilities.
14. The range of identifiers for organizational levels (i.e., the range of identifiers for OHMIS service areas, organizational units, job classes, installations, or facilities) for which this requirement is supposed to be applied. The information in this field also indicated whether all organizational levels of types specified above, or just selected ones, must apply this requirement. If selected ones are supposed to apply this requirement, the

## DATA SET 1

identifiers for this selection would be given. Up to five ranges of identifiers can be given in a single requirement. Additional requirements description data (DS1) would be needed if there are more than five ranges of identifiers, but this is not expected to be frequently the case. DA-wide requirements would answer "all" in this field and have the OHMIS service area as the type of organizational level at which the requirement is to be applied, i.e., the organizational level type code given above. It is expected that examination of each OHMIS service area's data would be made, periodically, to determine if the requirements applicability data for the requirement (i.e., the DS3, DS4, or DS17 data) had been implemented by all OHMIS service areas.

15. Description of the general applicability of this requirement (beyond that given in the organizational level type code identified above). Statements such as "whenever condition X exists" may be included here.
16. The OHMIS user type code (CT1) or the OHMIS position type code (CT2) of the type of person who is supposed to execute this requirement, i.e., the primary type of person who is to be notified of the need to implement this requirement. In this field the user may specify the type of person who should execute the requirement. This field may be left blank, if no such criteria are to be specified. If this field is completed and if there is a task type code (CT8) given above for this requirement, then the CT1 or CT2 provided here must be consistent with the set of CT1s or CT2s (if any) provided in the task type description data (DS23) corresponding to the above CT8 for the type(s) of persons who are considered "qualifiable" (i.e., are to be allowed to perform the task) for the task involved in this requirement.
17. Any additional description of the above type of user/position needed to enable the identification of the specific applicable person from the generically applicable person specified by the user/position type (CT1/CT2). For example an OHMIS position type will be the OHMIS Liaison Supervisor (i.e., the supervisor for an organizational unit who is responsible for interaction with OHMIS; this may be the same as the "regular" supervisor). The additional description may say "the OHMIS Liaison Supervisor for the job class in which the hazard was found," thus enabling the specific type of OHMIS Liaison Supervisor to be identified in a generic way.
18. The OHMIS user type code (CT1) or OHMIS position type code (CT2) of the management person (if any) who should be notified of the requirement in order to supervise its execution. Left blank if there is to be no such management



DATA SET 1

person or if the user does not wish to specify the type of person who should be this management person for this requirement.

19. Any additional description of the above type of user/position.
20. Types of disposition of this requirement, which require approval. Answers are Yes/No for each of the four dispositions of a requirement: (1) fully completed; (2) partially completed; (3) aborted (i.e., decided not to implement); and, (4) found not to be applicable. An answer of "Yes" for the first type of disposition would mean that the determination that this requirement has been fully completed requires approval, i.e., this requirement requires review by someone other than the executor of the requirement to confirm that the requirement has been fully executed; for the second type of disposition, a "Yes" would mean that the requirement cannot be considered executed if only partially completed unless there is approval for this disposition; for the third type of disposition, a "Yes" would mean that the requirement cannot be aborted without approval; and, for the fourth type of disposition, a "Yes" would mean that the requirement can not be determined to be not applicable without approval. The answer must be "Yes" for the last 3 types of disposition, if this is a mandatory requirement.
21. The OHMIS user type code (CT1) or OHMIS position type code (CT2) for the person, if any, who must approve the disposition of the requirement. May be left blank if there is to be no such approvals or if the user does not wish to specify the type of person who is to approve the requirement.
22. Recommended (or required) length of time for completing this requirement. May be left blank if no length of time is specified.
23. For periodic suspense requirements, e.g. routine surveillance, the required interval between each implementation of the requirement, e.g., this requirement is to be implemented every sixty days. For mandatory requirements the program will check that this interval is used in any requirements suspense data (DS4) for this requirement. For recommended requirements the user must indicate (document) in the DS4 data whether the DS1 specified interval is being used, and if not, why not. The program will check for consistency between the DS4 and DS1 data for this data element.

The required interval data supplied here is also used to provide this value on the DS4 data generated by this DS1 data, if this DS1 data is a 'suspense applicability data generating requirement'.

DATA SET 1

24. For periodic suspense requirements, the length of time that the requirement must be executed, e.g., the survey is to be conducted periodically (at the interval specified above) for a period of three years, for six months or indefinitely etc. For mandatory requirements the program will check that this length of time is used in specifying the "last suspense date" given in any requirement suspense data (DS4) for this requirement. For recommended requirements the user must indicate (document) in the DS4 data whether the DS1 data specified length of time is used and explain why not. The program will check for consistency between the DS4 and DS1 data. The length of time that the requirement must be executed is given in terms of days from the current date (i.e., days from the date that this requirement was triggered). This value may be left blank, if the requirement is one that is to be executed for an indefinite period of time.

This time period is also used to calculate the 'last suspense date' and enter it onto the DS4 data generated by this DS1 data for 'suspense applicability data generating requirements'.

25. Length of time (if any) that the hard copy, (i.e., the one with the signatures) of the Requirement Notification and Certification Record (O3) generated as a result of an implementation of this requirement, must be maintained. The O3 output is not only a notification to the user of the requirement, but can also become the hard copy on which the signatures of the persons who executed and approved the execution of the requirement are stored. This would be the case for those requirements of sufficient significance that a record of these signatures should be maintained. Answer can be '0' days.
26. Requirement identifier (ID6) for the requirement superseded by this requirement, if any.
27. Requirement identifier (ID6) for the higher level requirement for which this requirement constitutes an equivalent (as when a local level specifies a requirement that is not the same as, but is equivalent to, a higher level requirement), if any.
28. Document type code (CT6) for the type of document that is the source for this requirement, if any. An example would be the document type code assigned to the federal OSHA standards.
29. Document identifier (ID3) for the specific document that is the source of this requirement, if any. An example would be the OSMIS document identifier as signed to the OSHA 1910 standards promulgated on a given date.

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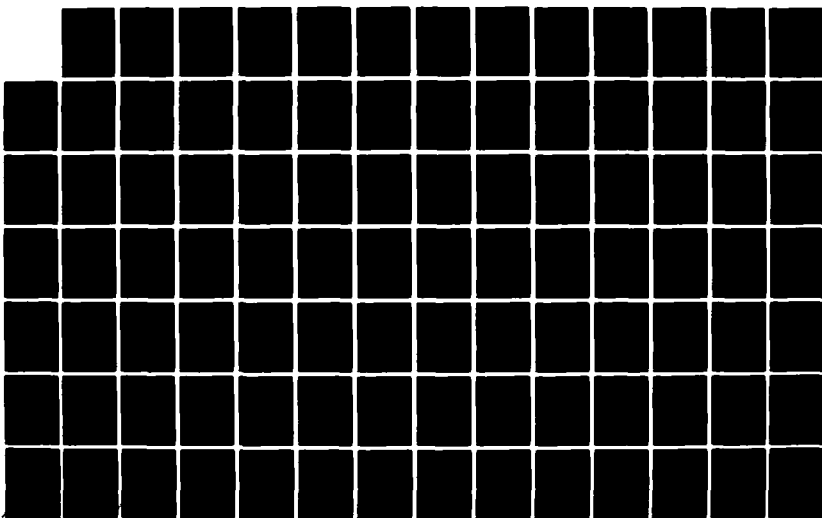
RECOMMENDED SYSTEM DESIGN FOR THE OCCUPATIONAL HEALTH  
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K KING ET AL. APR 83. F-977-VOL-1 MDA903-81-C-0515

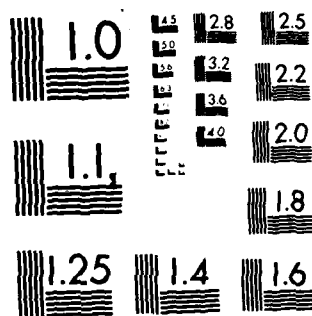
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30. Document subpart identifier (ID15) identifying the specific part of the above referenced document which contains the specific regulation, prescription or standard that is the source of this requirement.
31. Any additional information needed to describe the specific part of the above referenced document which contains the regulation, prescription or standard that is the source of this requirement.
32. Document identifiers (ID3), if any, containing a description of the rationale for this requirement (other than regulations), including the identification of any mishaps that led to the development of this requirement. The documents identified can include studies conducted or other reasons why this requirement was developed. The information in this field provides a mechanism for retaining the "lessons learned" which resulted in this requirement. This information is often lost (because there is no such mechanism for storing it) and can then result in a misinterpretation of the requirement or a failure to recognize the requirement's significance. It is considered important, therefore, to retain or reference this information.
33. OHMIS user identifier (ID13) or OHMIS position identifier (ID14) of the DA office promulgating this requirement or recommendation.
34. Employee identifier (ID4) of the individual person, if any, promulgating this requirement or recommendation.
35. Start date for when this requirement is effective, i.e., beginning date when requirement applicability data (i.e., DS3, DS4, or DS17 data) for this requirement can be generated.
36. End date for when this requirement is no longer to be used, i.e. when the applicability of this requirement is no longer to be specified in requirements applicability data (DS3, DS4, or DS17 data). Note: Historical data on all requirements is to be maintained. Requirements description data (DS1) cannot be deleted or changed (except to make corrections). This provides an audit trail for the DA requirement history. However, a requirement may become outdated in which case this end date for the applicability of the requirement is entered. The end date may be left blank if the requirement is still in effect.
37. The OHMIS user identifier (ID13) of the person approving deactivation of this requirement.
38. The employee identifier (ID4) of the above person.

## DATA SET 2

### Requirements Check Request Data

This data describes a particular request for a check for information triggered requirements, i.e., a request to execute a requirements check (Menu Selection Sequence 1.2.3; Function F2A). This data is not entered. It is generated by the computer program each time the user executes a step that has been identified as a triggering step and the OHMIS data base at the time of the triggering step was executed was found to not be sufficient to obtain all values for requirements applicability characteristics (DS8); that is if it was not possible to determine the applicability of requirements from existing OHMIS data, the requirements check request data (DS2) is generated. If it is possible to determine which requirements are applicable using the existing OHMIS data base, i.e., no requirements check is needed, the program generates the requirements implementation data (DS5) directly following the triggering step, the DS2 data generated by the triggering step is deleted, and the user does not need to execute a requirements check. DS2 data is used to generate the Requirements Check Notice (01) telling the user that a requirements check is needed.

1. Requirements check request identifier (ID1). Unique value assigned by the program to distinguish this set of DS1 data. Use to execute the requirements check program (Menu Selection Sequence 1.2.3; Function F2A) and to link information triggered requirements applicability data (DS3) to this requirements check request.
2. OHMIS service area identifier (ID10) for the service area of the user that triggered this requirement check request. This is obtained from the "log on" information of the user. Used by the program to quickly identify those requirements check request data sets (DS2) applicable to a given OHMIS service area.
3. Triggering step identifier (ID2) for the triggering step at which this requirements check request data was triggered.
4. Date on which this requirements check request was triggered, i.e., the date on which this DS2 data was generated.
5. Identifier or values for the identifier types (or data element types) that are the requirement implementation unit types 1 through 5 for the above referenced triggering step. (See triggering step requirements implementation identifier type data (DS6) for an explanation of triggering steps and requirement implementation units.)

The DS6 data identifies the codes for identifier types (CT10) or data element types (CT4) that are the requirement

## DATA SET 2

implementation units, while this DS2 data field provides the identifiers or values for the identifier types or data element types. For example, if one of the DS6 identifier types is information on the identity of an employee (i.e., the identifier type is "employee"), the DS2 value (identifier) would be the actual employee identifier (ID4) for a specific employee. The identifier or values data is entered as a part of the execution of the triggering step which triggered this requirements check request. There may be up to five types of requirement implementation units (DS6) for a given triggering step and therefore there may be up to five values for these units (DS2 data) in a given requirements check request data set.

### DATA SET 3

#### (Information Triggered) Requirements Applicability Data

This data prescribes the types of data elements that determine whether a requirement is applicable and what the values of these specified data elements (called applicability variables) must be for a requirement to be considered to be applicable, i.e., it describes the information triggers for information triggered requirements. Applicability variables can consist of values for the up to 5 requirement implementation units that can be entered at the time that a triggering step for a requirement is executed and the up to 5 characteristics for each of these units. DS3 data is entered by the user using Menu Selection Sequence 1.3.1. Historical data is maintained. DS3 data cannot be changed or deleted. If a set of DS3 data has been changed it should be deactivated and new DS3 data generated.

1. Requirement application identifier (ID5). Unique value assigned by the program to distinguish this set of DS3 data.
2. OHMIS service area identifier (ID10) for the service area covered by (and, in most cases, propagating) this application of the requirement. The program will only look for applications of requirements for the OHMIS service area of the user operating the OHMIS system at the time that the triggering step or requirements check is occurring. The OHMIS service area identifier (ID10) of a user is determined at the time that the user logs on to the OHMIS system.
3. OHMIS requirement identifier (ID6) for the requirement for which this data set is prescribing the applicability qualifications.
4. Triggering step identifier (ID2) for the triggering step at which a check for this applicability data is to be made.
5. The identifier for the organizational level type at which the determination of whether this requirement applies is to be made. This can be a OHMIS service area identifier (ID10), an installation identifier (ID11), an organizational unit identifier (ID12), a job class identifier (ID7), or a facility identifier (ID8) depending on the purview of the requirements applicability. The requirement description data (DS1) for the above referenced requirement identifier (ID6) prescribes at what type of organizational level (i.e., CT5) the requirement is to be applied (e.g., by service area, installation, etc.); this DS3 field provides an actual value for the organizational level at which it applies. The entry program must, therefore, check that the identifier value supplied here is consistent with the type of identifier for an organizational level (CT5) provided in the DS1 data for the requirement.



### DATA SET 3

6. The range of applicability values or identifiers, if any, for a requirement implementation unit type 1. This is the range of values (if any are specified) that the data element type that is the requirement implementation unit type one for the above reference triggering step must have for this requirement to be considered applicable. (The identifier type (CT10) or data element type (CT4) for the requirement implementation units for a triggering step are given in the DS6 data.). This range of values or identifiers may be blank, if there are no prescriptions of what this data element type must be for the requirement to be considered applicable. For example, the triggering step that is associated with the entry of a job class identifier (ID7) onto the vacant job class list (DL1), the job class identifier, is the requirement implementation unit. It may be that a requirement associated with this triggering step is applicable regardless of what job class identifier is entered, i.e., just the entry of any job class is to trigger a requirement. In this case the applicability value for the requirement implementation unit would be left blank. However, there may be some requirements that are triggered by this triggering step that apply only if one or more specific job class identifiers are entered; in this case one of the ranges of specific job class identifiers that must have been entered in the above referenced triggering step for the requirement to be considered applicable would be entered as the range of applicability values for the requirement implementation unit in this field. If there is more than one range of applicability values then more than one set of requirements applicability data (DS3) must be entered.

A range of values is entered in one of the following 10 ways: For the requirement to be considered applicable the value must be: a) equal to; or, b) not equal to one of the following: 1) a value; 2) greater than a given value; 3) less than a given value; 4) greater than a certain low end value and less than a certain high end value, i.e., within a specified range; or 5) less than a certain low end value or greater than a certain high end value, i.e., outside a specified range. Note: These 10 methods for entering ranges of values are used for all ranges of values entered in OHMIS. Although the five "not equal to" types of methods for entering ranges of values will not be used very frequently, they may be used in the ranges of values given in the allowable limits (and unallowable limits) specification data (DS17).

Because in this range of values the user is specifying the applicability values for a particular requirement implementation unit (i.e., one of five data element types specified on the triggering step requirement implementation unit data element types data (DS6)), the entry program must

### DATA SET 3

check to see that the range of values entered are consistent with the types of data elements for the requirement implementation unit to which this applicability values data refers.

7. The data element type code (CT4), if any is specified, for the applicability characteristic type 1 (for requirement implementation unit type 1) for this application of the requirement. As indicated above, applicability variables are those data element types which are used to determine whether an information triggered requirement is applicable and the requirement implementation unit may be an applicability variable, i.e., its value may determine whether the requirement is applicable. However, there may also be characteristics which the requirement implementation unit must have for the requirement to be considered applicable. These are referred to as applicability characteristics. The data element type that describes the first type of characteristic that the first requirement implementation unit (i.e. type 1) must have for the requirement to be applicable is the one given in this field. For example, if a requirement is to be triggered by the entry of an employee identifier (ID4) onto the potential new hire list (DL2), this requirement may apply regardless of the characteristics of the employee (in which case there would be no applicability characteristics type of applicability variables for this requirement implementation unit) or it may be applicable only if the employee is over age 50 (in which case the "employee age" would be the applicability variable for the requirement implementation unit).

Because in this data element the user is describing the type of characteristics that requirement implementation unit type 1 must have, the program must check that the data element type information (DS7) for the data element type code (CT4) entered here is a type of data element that describes characteristics of the type of requirement implementation unit that is requirement implementation unit type 1. (Requirement implementation unit type 1 is defined in the DS6 data for the above reference triggering step.) For example, "employee age" could only be given as the data element type for the type of applicability characteristic if requirement implementation unit type one was an employee identifier (ID4); it would not be consistent if this applicability characteristic was given and the requirement implementation unit being described was anything other than an employee identifier.

8. The range of applicability values for applicability characteristics type 1 (for requirement implementation unit type 1). This data prescribes the range of values data for the first applicability characteristic for the first requirement implementation unit, i.e. the values that the

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above referenced applicability characteristic for this requirement implementation unit must have for the requirement to be considered applicable. In the above example, in which the data element type for the applicability characteristic was "employee age," this field would have the range of ages for which the requirement is applicable (i.e., in the above example, the range would be "greater than 50").

9. The data element type codes (CT4) and range of applicability values for applicability characteristic types 2 through 5 for requirement implementation unit type 1 (if any are specified).
10. The range of applicability values for requirement implementation units two through five and the corresponding sets of up to five applicability characteristics (data element types and values) for each of these requirement implementation units (if any are specified).
11. Supplement to the requirement description. This is any additional explanation of the requirement triggered by this set of DS3 data beyond the description given in the requirement description data (DS1) that explains this particular application of the requirement.
12. Description of the conditions that will have existed that will trigger the implementation of this requirement. This description is used in output such as the Requirement Notification and Certification Record (O3) to inform the user of why this requirement was implemented. It includes a description of those applicability variables, the values for which are to be included in the description of why this requirement was triggered that will be given on the output. For example, a description of the rationale for implementing a requirement that was triggered by the entry of a job class identifier (ID7) onto the vacant job class list (DL1) (i.e., DS1) would probably include the title of the job class. This would be done by statements such as "This requirement was triggered by the entry of the below referenced job class title on the Vacant Job Class List." This statement would appear on an O3 type of output followed by the values for the applicability variables identified in this data set.
13. Description of any additional checks that the user should exercise to determine whether the requirement is applicable and should be implemented, beyond those specified in the applicability variables data. This would include restrictions on the applicability of the requirement that cannot be specified through applicability variables data. For example, if something or someone that is not a requirement implementation unit (and therefore cannot be covered in the applicability variables data) must have a certain characteristic for the

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requirement to be considered applicable, this applicability information would be described here. Also, if the user wishes to indicate that the requirement need not be implemented if the same requirement has already been done recently (within a specified time period), this information would be described here. It will be suggested that the description given here include the Menu Selection Sequence for conducting the type of data analysis, if any, needed to conduct this additional check.

14. The start date (activation date) for this application of the requirement. This is the date that this application of the requirement is to be activated. This date is used to enable an audit trail, i.e. a trail to identify all applications of a requirement that were active as of a given date.
15. The end date (deactivation date) for this application of the requirement. Historical requirements applicability data (DS3 data) is maintained by OHMIS, i.e., even when an application of a requirement is no longer active, data about that application is kept in order to provide an audit trail. Therefore, to stop the application of a requirement a deactivation date must be entered.
16. Employee identifier (ID4) and OHMIS user identifier (ID13) for the person who prescribed this application of the requirement.
17. Employee identifier (ID4) and OHMIS user identifier (ID13) for the person who approved deactivation of this requirement.
18. The OHMIS user identifier (ID13) or OHMIS position identifier (ID14) for the user/position of the person who is supposed to execute this requirement, i.e., the primary person who is to be notified of this requirement. This is the office (user or position) that is designated to execute this requirement for the OHMIS service area (ID10) in which this set of requirements applicability data (DS3) was generated. This field is only completed if the requirement description data (DS1) referenced by the above requirement identifier (ID6) does not specify a task type code (CT8) for the requirement. This is because, if there is no task associated with the requirement, it will not be possible to 'automatically' determine who is suppose to execute the requirement and, therefore, the user must supply the identity of this person in this field. If the DS1 data for the above ID6 on this set of DS3 data specifies the type of OHMIS user/position (CT1 or CT2) that should execute this task, the ID13 or ID14 given here must be consistent with these CT1 or CT2 codes; the determination of this consistency is based on the OHMIS user/position identifier by OHMIS service area list (DL8). (Note: the advantage of giving an OHMIS user or

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position identifier in this field instead of an employee identifier is that the actual individual filling the user or position office can be changed without having to change the applicability data; the actual person filling the user or position office is determined at the time that the requirements implementation data (DS5) is generated.

19. The OHMIS user identifier (ID13) or OHMIS position identifier (ID14) (or, if not a user/position, the employee identifier (ID4)) for the management person, if any, who should be notified of the requirement in order to supervise its execution. Must be consistent with the DS1 data, if any was provided.
20. The OHMIS user identifier (ID13) or OHMIS position identifier (ID14) (or, if not a user/position, the employee identifier (ID4)), if any of the person who is supposed to approve the disposition of the requirement. This identifier must be consistent with the type of user/position specified in the DS1 data, if any was specified. If the DS1 data indicated that no such approvals are necessary, this data element would be left blank.

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### Requirements Suspense Data (Date Triggered Requirements Applicability Data)

This data prescribes the occasion (date or dates) on which a requirement is to be implemented, i.e., the triggers for date triggered requirements. It is similar in effect to the information triggered requirements applicability data (DS3) which is for requirements triggered by the entry of certain information rather than by a particular "due date." To trigger a date triggered requirement from the DS4 data, the OHMIS program conducts a suspense check (see Step F1A-2 in Function F1A) consisting of a review of all requirements suspense data (DS4). A suspense check is done periodically (once each day that the OHMIS system is used) and includes the identification of those requirements that have come due and the generation of requirements implementation data (DS5) for these requirements.

DS4 data is generated in two ways: (1) It may be entered by the user using Menu Selection Sequence 1.4.1. (2) It may be generated 'automatically' by the OHMIS program whenever a 'suspense applicability data generating requirement' is found to be applicable. (See requirement description data (DS1) for a description of the meaning of a 'suspense applicability data generating requirement'.)

With the exception of Reminder Notice type suspense data (see below), historical DS4 data is maintained in order to have an audit trail of what requirements were in effect. DS4 data cannot be changed or deleted. If DS4 data should be changed or should no longer be used before the "last suspense date" (end date) on the requirement, the user may cancel the suspense date by entering a deactivation date for the requirement.

1. Requirement application identifier (ID5). Unique value assigned by the program to distinguish this set of DS4 data.
2. OHMIS service area identifier (ID10) for the service area covered by this application of the requirement. The program will only look for applicability data for requirements for the OHMIS service area of the user which triggered the requirements suspense check, i.e., the user who had logged onto the system at the time that the daily requirement suspense check is to be conducted. The OHMIS service area identified (ID10) is supplied by the user when entering the DS4 data; normally, it would be the same ID10 as the service area to which the user generating the requirement belongs. However, this is not necessarily the case. For example, requirements applicability data may be generated at the DA level for an individual OHMIS service area.

For DS4 data generated from 'suspense applicability data generating requirements', the ID10 would be the same as the ID10 on the information triggered requirements applicability

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data (DS3) or the allowable limits specifications requirements applicability data (DS17) which found the suspense applicability data generating requirement (DS1) that generated the DS4 data to be applicable, i.e., that triggered the requirement which in turn generated the DS4 data.

3. Identifier of the organizational level to which this requirement applies. (See DS3 data for explanation of this data element. Not used in Reminder Notice type of suspense data.) For DS4 data generated from 'suspense applicability data generating requirements', the identifier would be the same as that given in the DS3 data or DS17 data that triggered the suspense applicability data generating requirement.
4. Whether this suspense data is to be used for requirement implementation monitoring as distinguished from simply b used to generate "reminder notice" type of suspenses.  
Answer: Yes/No. The primary purpose of DS4 data is to track of requirements (recommendations) that are to be done on a certain date (e.g., annual Industrial Hygiene Surveys of a facility, biannual hearing tests of employees). However, because the data processing is very similar, the user will be allowed to use this same DS4 data to generate a "reminder notice" to remind the user of an event or action that is not linked to a requirement. If this is the use that is being made of this particular execution of suspense data, the user would enter a 'No'. For DS4 data generated from 'suspense applicability data generating requirements', the answer would be 'Yes'.

If this is Reminder Notice type of suspense data, the program will operate differently in several ways: Several of the suspense data elements are not requested if the user has answered 'No' in this field. Also, the requirements implementation data (DS5) will be shown on a Reminder Notice List (05), rather than an Outstanding Requirements List (04) and a Requirement Notification and Certification Record (03). Also, neither the DS4 data nor the requirements implementation data (DS5) for Reminder Notice type suspense data will be archived. Historical requirements DS4 and DS5 data is maintained in OHMIS in order to provide an audit trail, but historical data on Reminder Notices is not maintained. This is because it is expected that if an action is not related to a requirement, it will not be of sufficient significance to maintain historical data on it. The DS5 data for a Reminder Notice type of date triggered action is deleted when the disposition data (i.e., the date and type of disposition of the action entered in Menu Sequence 1.5.3; Function F28) is entered by the user for that set of DS5 data. The set of Reminder Notice type of DS4 data that corresponds to the DS5 data is deleted when the DS5 data has

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been deleted and the "deactivation date" on the DS4 data has been filled.

5. OHMIS requirement identifier (ID6) for the type of requirement which this set of suspense data is going to trigger. The requirement identifier (ID6) links the DS4 data to the requirement (recommendation) description data. This field will be left blank if this is a Reminder Notice type of suspense data. For DS4 data generated from 'suspense applicability data generating requirements', the ID6 is the ID6 on the 'suspense applicability data generating requirement' which generated this DS4 data.
6. Supplement to the requirement description. This field provides any additional explanation of the requirement beyond that given in the requirement description data (DS1); it is used to explain this particular execution of the requirement. It would be used in place of the requirement description given on the DS1 data with the above requirement identifier (ID6) for Reminder Notice type suspense data, i.e., this field describes the Reminder Notice action, because for Reminder Notice type suspense data there will be no DS1 data to describe the requirement. It may be left blank or used for requirement type suspense data. For DS4 data generated from 'suspense applicability data generating requirements', this description would be copied from the DS3 data or DS17 data that triggered the 'suspense applicability data generating requirement'.
7. Task type code (CT8) that describes the action specified in this DS4 data. For Reminder Notice type of DS4 data, this field is supplied by the user, if applicable; for all other DS4 data (including requirement type DS4 data and DS4 data generated by suspense applicability data generating requirements), this information is obtained from the DS1 data referenced by the ID6 above. However, it may be left blank on the DS4 data (or have been left blank on the DS1 data) if the type of action that is to be triggered by this requirement is not a "scheduleable" type of action, i.e., not an action that the OHMIS scheduling program (Function F4) is to schedule.
8. Description of any additional checks that the user should exercise to determine whether the requirement is applicable and should be implemented, beyond those checks specified by this suspense data. (See DS3 for further explanations of the use of additional checks.) This field is not used for Reminder Notice type of suspense data. For DS4 data generated from 'suspense applicability data generating requirements', this description would be copied from the DS3 data or DS17 data that triggered the 'suspense applicability data generating requirement'.



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9. Description of the Menu Selection Sequence, if any, for undertaking the data processing actions associated with the above referenced additional checks. For DS4 data generated from 'suspense applicability data generating requirements', this description would be copied from the DS3 data or DS17 data that triggered the 'suspense applicability data generating requirement'.
10. Identifier type codes (CT10) or data element type codes (CT4) and for the requirement implementation unit types 1-5. This identifier types (or data element types) describe the type of unit (or set of units) to which this application of the requirement is to apply. For example, a requirement to conduct annual medical surveillance on an employee would have an employee as the type of unit to which this requirement is to apply, i.e., the identifier type would be "employee." There may be up to five requirement implementation units if the requirement refers to a set of units. This data may be left blank.

For DS4 data generated from 'suspense applicability data generating requirements', the requirement implementation unit types are known from the DS3 data or DS17 data that triggered the suspense applicability data generating requirements (DS1). For DS4 data generated for a requirement triggered by DS3 data, the requirement implementation unit types are given on the triggering step requirement implementation unit identifier types data (DS6) corresponding to the triggering step given on the DS3 data. For DS4 data generated from requirements triggered by DS17 data, the requirement implementation unit types are obtained from the DS17 data.

11. Identifiers or values of the above referenced identifier types (of data element types) for requirement unit types 1-5. These are the single identifiers (or values), not ranges of values, for each of the requirement implementation unit types identified above. For example, if the requirement implementation unit type identified above was an employee, the data in this field would specify a particular employee identifier (ID4) for which this application of the requirement is to be monitored, e.g., the identity of the specific employee for whom the next suspense date for implementing medical surveillance is to be monitored. This data may be left blank. For DS4 data generated from 'suspense applicability data generating requirements', the identifiers or values for the requirement implementation units are known by the DS3 data or DS17 data that triggered the 'suspense applicability data generating requirement'. For DS4 data generated from a requirement triggered by DS3 data, the identifiers or values for the requirement implementation units come from the requirements check request

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data (DS2) that was generated by the triggering step that resulted in the check of the DS3 data for applicable requirements. For DS4 data generated from a requirement triggered by DS17 data, the identifiers or values for the requirement implementation units come from the allowable limits check request data (DS18) that was generated at the time that the evaluation of allowable limits that identified the DS17 data was made.

12. The employee identifier (ID4) and OHMIS user identifier (ID13) for the person prescribing this application of the requirement. For DS4 data generated from 'suspense applicability data generating requirements', this description would be copied from the DS3 data or DS17 data that triggered the 'suspense applicability data generating requirement'.
13. The OHMIS user identifier (ID3) or OHMIS position identifier (ID14) for the user/position of the person who is to execute the requirement, i.e., the primary person who is to be notified of the requirement. (See DS3 data for further explanation of this field.) For DS4 data generated from 'suspense applicability data generating requirements', this description would be copied from the DS3 data or DS17 data that triggered the 'suspense applicability data generating requirement'.
14. The OHMIS user identifier (ID13) or OHMIS position identifier (ID14) (or, if not a user/position, the employee identifier (ID4)), for the management person, if any, who should be notified of the requirement in order to supervise the execution of the requirement. (See DS3 data for further explanation of this field. Not used in Reminder Notice type of suspense data.) For DS4 data generated from 'suspense applicability data generating requirements', this description would be copied from the DS3 data or DS17 data that triggered the 'suspense applicability data generating requirement'.
15. The OHMIS user identifier (ID13) or the OHMIS position identifier (ID14) (or, if not a user/position, the employee identifier (ID4)), of the person, if any, who must approve the disposition of the requirement. (See the DS3 data for further explanation of this field) Not used in Reminder Notice type of suspense data. For DS4 data generated from 'suspense applicability data generating requirements', this description would be copied from the DS3 data or DS17 data that triggered the 'suspense applicability data generating requirement'.
16. Whether this application of the requirement is to be implemented more than once. Answers: Yes (periodically triggered requirements) or No (one-time triggered requirements). For DS4 data generated from 'suspense

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applicability data generating requirements', this field comes from the DS1 data corresponding to the ID6 given above.

17. First suspense date, i.e., first date that the requirement is to be implemented. This date is supplied by the user. If it is a one-time triggered requirement, this would be the one date on which the requirement is to be triggered. If it is a periodically triggered requirement, this date would be the first of the several dates on which this requirement is to be triggered. For DS4 data generated from 'suspense applicability data generating requirements', this date is calculated by adding the amount of days until the 'first suspense date' (from the current date) that is provided on the DS1 data corresponding to the ID6 given above.
18. Last suspense date, i.e., the last date that this requirement is to be triggered. This date indicates how long a periodically triggered requirement is to be triggered, e.g., for a requirement that is to be triggered every month for six months, the user would enter as a "last suspense date" the date that is six months from the "first suspense date." For some periodic requirements (including all those for which the DS4 data is generated by a suspense applicability data generating requirement), the requirement description data (DS1) will have specified the period of time that the requirement must be executed; this data will be used by the program to calculate a "last suspense date" for the user (based on the first suspense date). If the user wishes to override the DS1 specified last suspense date, this variance from the requirement and the reason for the variance is also indicated in this field as well as the last suspense date. For mandatory requirements, the DS1 specified last suspense date must be used. The DS4 entry program (Menu Selection Sequence 1.4.1) will check for internal consistency between the DS1 data and the DS4 data.

The last suspense date is automatically filled in the same as the "first suspense date," if this is a one-time triggered requirement. The last suspense date may be left blank for periodically triggered requirements if the user wishes the requirement to be periodically implemented for an indefinite period of time. When this last suspense date is reached, the DS4 data is considered to be deactivated (i.e., the deactivation date is filled in with the current date by the OHMIS program as a part of the suspense check function (Function F1A)). For Reminder Notice type of suspense data, once the DS4 data has been deactivated and the last requirement implementation data (DS5) has been generated and executed (i.e., all disposition data has been entered on the DS5 data), the DS4 data is deleted.

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19. The deactivation date. This date is completed when the DS4 data is no longer active. The program may fill in this date automatically once the calculated "next date" is found to be later than the "last suspense date" in the suspense check function (Function F1A); or, if the user wishes to cancel a set of DS4 data, s/he may fill in the deactivation date using Menu Selection Sequence 1.4.4.
20. The OHMIS user identifier (ID13) of the person who approved the cancellation (deactivation) of this set of DS4 data. This field would be the same as the person who promulgated this application of the requirement if the last suspense date is entered at the same time as the DS4 data was entered and the last suspense date (not an intervening cancellation date) was used as the deactivation date for the requirement.
21. The employee identifier (ID4) for the above person.
22. Prior notification time, i.e., the amount of time prior to the suspense date (due date) that the generation of a notice about the need to execute the requirement (or a Reminder Notice) should be triggered. The value in this field may be "0", if there is no need for a prior notification time period, i.e., the requirement can be executed on the day that the person is notified that the requirement has come due. For DS4 data generated from 'suspense applicability data generating requirements', this field comes from the DS1 data corresponding to the ID6 given above.
23. Suspense interval, i.e., interval of time between suspense dates for periodically triggered requirements, e.g., this requirement is to be triggered once every two months. For DS4 generated by suspense applicability data generation requirements, this length of time will be specified in the requirement description data (DS1); for DS4 data entered by the user, this length of time may be specified in the DS1 data or by the user. The DS1 specified interval, if any has been provided, will be used unless the user specifies that the DS1 interval is to be overridden. In that case, the interval is supplied by the user along with the reason why the interval was overridden. The DS4 entry program (Menu Selection Sequence 1.4.1) checks that the DS1 data and the DS4 data are internally consistent. For mandatory requirements the user must use the DS1 specified interval, if any has been specified.
24. Next suspense date, i.e., next date, this suspense is to be triggered. This date is supplied by the program as a part of the suspense check (Function F1A). For the first time this requirement is to be implemented, the "next date" is the same as the "first suspense date," minus the "prior notification time." At the time that the program makes a suspense requirements check (Step F1A-2) to see what requirements have come due and finds this suspense to be due, the program

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updates the "next date," the algorithm being: the old "next date" plus the suspense interval with a check to determine that the new "next date" is not later than the "last suspense date," in which case the suspense is treated as though the "last suspense date" has been reached, i.e., the suspense data is deactivated and the old "next date" remains on the DS4 data. In the case of Reminder Notice type of suspense data, the DS4 data is not deleted until the disposition data has been entered for the DS5 data generated by the current triggering of a requirement, i.e., the triggering that resulted in the comparison of the "next date" and the "last suspense date."

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### Requirements Implementation Data

This data describes the details of a requirement (or recommendation) that has been triggered by the OHMIS program; it is also used to describe the details of Reminder Notices, i.e. nonrequirements triggered by a suspense date. "Triggered" means that the program has determined that an action is required (recommended), i.e., that a particular requirement (recommendation) is applicable or due. The DS5 data is used to monitor the execution of the required (recommended) action and to provide a record of the disposition of the requirement (recommendation).

DS5 data is generated by the program from one of three types of data:

- o (Information triggered) requirements applicability data (DS3). A requirement can be triggered when certain parts of the OHMIS program, referred to as triggering steps, are executed. Triggering steps are primarily data entry program steps. When the triggering step is executed, the program determines whether the data entered in the triggering step matches the DS3 data; if it does a requirement is triggered and the DS5 data for the requirement specified in the DS3 data is generated. Thus the DS3 data is referred to as information triggered requirements applicability data because it is the entry of information at a triggering step that results in a check to determine whether a requirement is applicable, and if the requirement is applicable, the triggering of a requirement through the generation of DS5 data.
- o Requirements Suspense Data (DS4). A requirement can be triggered by the arrival of a "due date." Due dates are shown on DS4 data. The OHMIS program checks periodically to determine if a due date has arrived, i.e. if the current date matches the "next suspense date" information on the DS4 data. If it has arrived, DS5 data is generated to monitor the requirement that DS4 data specifies is to be executed on the due date. DS4 data can also be used as simply a Reminder Notice system; that is, a suspense date "tickler file" for nonrequirements. DS5 data is generated in the same way for Reminder Notice type suspense data as it is for requirement (recommendation) suspense data.
- o Allowable limits specification data (DS17). A requirement can be triggered by the entry of data from an OHMIS form (i.e., completed forms data (DS14)) that is found to match an allowable (or unallowable) limit specified on a set of DS17 data. Whenever such a match is found for the requirement specified, the DS17 data is generated.

DS5 data is used to monitor the execution of the requirement by telling the user of a requirement using the Outstanding Requirements Lists (04)

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and the Requirement Notification and Certification Record (03) (or the Reminder Notice List (05)) and by allowing the user to enter data on the disposition of the requirement, i.e., information about the completion of the requirement, using Menu Selection Sequence 1.5.3 (Function F2B).

With the exception of the disposition data part of the DS5 data, DS5 data is not entered by the user, but is generated by the OHMIS program whenever a requirement is found to be applicable through: (1) checking the DS3 data during the execution of a triggering step or during a requirements check (Menu Selection Sequence 1.2.3 (Function F2A); requirements checks are manual, i.e. user conducted, checks of DS3 data which follow a triggering step, if the OHMIS program is not able to automatically determine whether there is a set of applicable DS3 data corresponding to the data entered during the triggering step); (2) checking the DS4 data during a requirements suspense check (see Function F1A); or, (3) checking the DS17 data during the entry of DS14 data from a completed OHMIS form (Menu Selection Sequence 3.1; Function F3B) or during an allowable limits check (Menu Selection Sequence 4.4.4; (Function F3C); an allowable limits check is executed manually, i.e. by the user, when the OHMIS program is not able to determine automatically whether or not a match to a specified allowable limit has been entered on an OHMIS form). For information triggered requirements (based on DS3 data) and allowable limit triggered requirements (based on DS17 data) the user may need to enter part of the DS5 data during the requirements check (Menu Selection 1.2.3; Function F2A) or the allowable limits check (Menu Selection Sequence 4.4.4; Function F3C), if not all of the data needed to determine whether a requirement is applicable is available in the current OHMIS data base at the time of the execution of the triggering steps (for DS3 data) or at the time of the entry of the completed forms data (for DS17 data). Otherwise, and for all date triggered requirements (based on DS4 data), the program automatically (i.e., without user input) generates the DS5 data when it is triggered.

The disposition data part of the DS5 data is entered by the user using Menu Selection Sequence 1.5.3 (Function F2B). Historical DS5 data is maintained. The DS5 data cannot be deleted and only the disposition part of the DS5 data can be changed (Menu Selection Sequence 1.5.5).

The values data determining the applicability of a requirement (i.e., either the requirements check request data (DS2) and values data for requirements applicability characteristics (DS8) for information triggered requirements; or, the allowable limits check request data (DS18) for allowable limits triggered requirements) is used in generating DS5 data and is deleted when the DS5 data is generated.

At the same time that the DS5 data is generated, the requirement implementation identifier (ID9) is entered onto the Outstanding Requirements Lists (04 and DL3) to be used to remind the user that there is an outstanding (unexecuted) requirement.

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Also, immediately following the generation of DS5 data, the program checks to determine whether the requirement being implemented by the DS5 data refers to a specified task, i.e., whether the requirement description data (DS1) for the requirement covered by this DS5 data contains a task type code (CT8) specifying the type of task that is involved in executing the requirement. If there is such a task type code (CT8) on the DS1 data, the program will 'automatically' schedule the task in Function F4A, i.e., the program schedules the execution of the requirement by generating a set of specific task scheduling data (DS24) for the task and scheduling this task through putting the task identifier (ID23) for the DS24 data into the needed time slots on a set of monthly schedule data (DS27). The scheduling of the task is done by putting the requirement implementation identifier (ID9) for the newly generated set of DS5 data onto the list of requirement implementation identifiers for requirements having tasks that need to be scheduled by OHMIS service area (DL35). Each day that a user logs onto the OHMIS system (Function F1A), the OHMIS program checks to determine if there are any entries on the DL35 list for the OHMIS service area of the user who logged on. If there are, the OHMIS program goes to Function F4A and schedules those tasks on the DL35 list.

1. Requirement implementation identifier (ID9). Unique value assigned by the program to distinguish this set of DS5 data.
2. Document identifier (ID3) for the Requirement Notification and Certification Record (03) on which the hard copy of the disposition of the requirement is to be stored. The 03 output is not only a notification to the use of a requirement, but can also become the hard copy on which the signatures of the person who executed and approved the execution of the requirement are stored (for those requirements of sufficient significance that a record of these signatures should be maintained). In order to identify the 03 record on which this information is stored, the program assigns a document identifier (ID3) for each implementation of a requirement. This identifier is printed out on the 03 record. The identifier is assigned at the time that the DS5 data is generated in order that the same document identifier will appear on every generation of the Requirement Notification and Certification Record (03) for the same requirement made; this output could be generated several times before the requirement is executed. No document identifier is assigned for Reminder Notice (nonrequirement) types of DS5 data.
3. The requirement application identifier (ID5) for the particular set of information triggered requirements applicability data (DS3), requirements suspense data (DS4) or allowable limits specification data (DS17) that triggered this implementation of the requirement. This identifier links the DS5 data to the other data about the implementation



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of the requirement given on the corresponding DS3, DS4, or DS17 data.

4. The type of trigger that generated this set of DS5 data. Whether the above ID5 is for: (1) an information triggered requirement (triggered by DS3 data); (2) a date triggered requirement (triggered by DS4 data for a requirement); (3) a Reminder Notice (nonrequirement triggered by DS4 data); (4) an allowable limits triggered requirement (triggered by DS17 data) for an allowable limits specification made for a forms subpart (i.e., an allowable limit for a set of up to six data elements on a form); or (5) an allowable limits triggered requirement (triggered by DS17 data) for an allowable limits specification made about the entry of a form-as-a-whole (i.e., an allowable limit made about the number of times that a particular type of form can be entered onto the OHMIS system for a particular unit; as when the entry of too many reports of hazardous substance spills for a given facility is to trigger a requirement).
5. OHMIS requirement identifier (ID6) for the requirement that is to be implemented and monitored by this set of DS5 data. Comes from the DS3, DS4, or DS17 data corresponding to the above ID5. Left blank if this DS5 data is generated from Reminder Notice type suspense data.
6. The OHMIS service area identifier (ID10) for the service area in which this requirement implementation originated. From DS3, DS4, or DS17 data. Used by the program to quickly identify all implementations of requirements for a given OHMIS service area.
7. Date on which this requirement was triggered, i.e., date this set of DS5 data was generated. For information triggered requirements, this is the date that the requirement check was made, i.e., the date that the triggering step was executed, if the DS5 data was generated automatically from the DS3 data; or, the date that the user supplied the remaining information needed to determine if a requirement was applicable during a requirements check (Menu Selection Sequence 1.2.3; Function F2A). For allowable limits triggered requirements, this is the date that an allowable limit evaluation was made, i.e., the date that the data from a completed OHMIS form (DS14 data) that matched the allowable limits on the DS17 data was entered onto the OHMIS system, if the DS5 data was generated automatically from the DS17 data; or, the date that the user supplied the remaining information needed to determine which allowable limit was applicable during a allowable limits check (Menu Selection Sequence 4.4.4; Function F3C). For date triggered requirements, this is the date that the OHMIS 'log on' program (Function F1A) found that a set of DS4 data had a due date that matched the current date, i.e., found that the

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current date was equal to or later than the due date minus the prior notification time period on the DS4 data. (This is referred to as the "next suspense date" on the DS4 data.)

8. Requirement due date. The date that the requirement is due, if any. This field is completed in several ways:
  - (1) If this set of DS5 data triggered (i.e., generated from DS4 data), then the due date for the requirement is the 'next suspense date' plus the 'prior notification time' given on the DS4 data.
  - (2) If this set of DS5 data is from a requirement with a task type code (CT8) specified in the requirement description data (DS1) corresponding to the requirement identifier (ID6) for which this is the requirement implementation data (DS5) (i.e., the ID6 given below), then the due date for the requirement (as distinguished from the due date for the task) is:
    - (a) The current date plus the length of time required (recommended) to complete the requirement given in the DS1 data; or,
    - (b) The current date plus the length of time allowed to complete this task (as specified in the task type description data (DS23) corresponding to the task type code (CT8) given below) whichever is later. Note: The due date for the requirement need not be the same as the due date for the task triggered by this requirement, because the requirement could involve more than completing the task; however, the due date for the requirement cannot be before the due date for the task triggered by the requirement.
9. Requirements check request identifier (ID1) or allowable limits check request identifier (ID22) for the requirements check under which this set of DS5 data was generated (for information triggered requirements) or the allowable limits check or evaluation under which this set of DS5 data was generated (for allowable limits triggered requirements). An ID1 corresponds to a set of requirements check request data (DS2); an ID22 corresponds to a set of allowable limits check request data (DS18). The DS2 or DS18 data is deleted when the DS5 data is generated.
10. Values for the requirement implementation units, i.e., the unit(s) to which the requirement applies. These are the up to 5 requirement implementation units (for DS3 or DS4 data); or, the up to 6 forms units for allowable limits applicable to forms subparts that have been designated as requirement implementation units, or, the up to 9 forms units for allowable limits applicable to forms-as-a-whole that have

## DATA SET 5

been designated as requirement implementation units (for DS17 data). Requirement implementation units indicate to what unit or combination of units the requirement applies. The values for the requirement implementation units for information triggered requirements come from the DS2 data corresponding to the above ID1. The values for the date triggered requirements implementation units come from the DS4 data corresponding to the above ID5. The values for the forms units designated as requirement implementation units for allowable limits triggered requirements come from the DS18 data corresponding to the above ID22.

11. Values for the applicability characteristics (factors) determining which requirement is applicable. There are no applicability factors data for date triggered requirements. For information triggered requirements these factors come from the values data for requirements applicability characteristics (DS8) corresponding to the above ID1. (The DS8 data is deleted when the DS5 data is generated) For allowable limits triggered requirements these values come from the allowable limits check request data (DS18) corresponding to the above ID22.
12. Completed forms identifier (ID18) for the form containing the data entered onto the OHMIS system that triggered an allowable limits requirement. This is the first ID18 on the DS18 data corresponding to the ID22 given above. Used only for allowable limits triggered requirements.
13. The completed forms identifier(s) (ID18) for the form(s) containing the base line values used in the allowable limits evaluation that triggered this set of DS5 data to determine whether the values entered on the completed forms data (DS14) match the prescribed allowable limits. This is only used for DS5 data triggered by type 4 triggers, i.e., allowable limits triggered requirements for allowable limits matching forms subpart data. There can be up to six ID18s if the base line used (or chosen) was entered on different forms for each of the up to 6 data elements in the forms subpart for which the allowable limit evaluation triggered a requirement. There may be no values entered in this field if the allowable limits did not involve a reference to base line data. This data comes from the DS18 data corresponding to the above ID22.
14. The values for the above base lines entries. There can be up to six values. From the DS18 data corresponding to the above ID22.

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15. OHMIS user identifier (ID13) or OHMIS position identifier (ID14) on the person who is supposed to execute the requirement. This data comes from either the requirements applicability data (DS3, DS4, or DS17 data), for requirements that do not have a task type code (CT8) specified for them in the DS1 data on the requirement which they triggered; or, from the specific task scheduling data (DS24) for the task that is triggered by the implementation of a requirement that is covered by this DS5 data. The DS24 data may not contain such an ID13/ID14 immediately after the DS24 data is generated, because the OHMIS program was unable to schedule the task triggered by this requirement. In this case, a code indicating that the requirement is unscheduled is temporarily entered here. That code is treated like an OHMIS user/position in that when generating the outputs telling user of an outstanding requirement (i.e., Outstanding Requirements List (04) and the Requirement Notification and Certification Record (03), this requirement is listed under the "user/position" "no user/position for completing this task identified" code. This remains true until the user supplies the information needed to schedule the task and identifies the person who is suppose to execution the task.
16. The current employee identifier (ID4) corresponding to the OHMIS user/position identifier (ID13 or ID14) from above for the person who is supposed to execute the requirement. For DS5 data for requirements without a task type code (CT8) specified in the DS1 data corresponding to the above ID6, the data for this field is obtain at the time that the DS5 data is generated from the current user/position identity and address data (DS9) which contains the employee identifier for the person currently filling each OHMIS user/position office. For requirements with a task specified, the ID4 for this field comes from the specific task scheduling data (DS24).
17. The same as above for the management person, if any, who is supposed to be notified of the requirement in order to supervise its execution.
18. The same as the above for the person, if any, who is supposed to approve the disposition of the requirement.
19. Task type code (CT8) for the type of task that was triggered by this set of requirements implementation data (DS5), if any. From the requirement description data (DS1) corresponding to the above requirement identifier (ID6), if any, task type code (CT8) was specified for this requirement.
20. Task identifier (ID23) for the task that was triggered by this set of requirements implementation data (DS5), if any was triggered. This identifier is from the specific task scheduling data (DS24) generated for the task triggered by this DS5 data.

## DATA SET 5

### Disposition Data Elements

The following are data elements, referred to as "disposition data elements," that are entered by the user using Menu Selection Sequence 1.5.3 (Function F28). These data elements indicate the disposition of the requirement, i.e., the way in which was completed or executed. The user enters this data by manually completing the bottom portion of the Requirement Notification and Certification Record (03) or Reminder Notice List (05); these completed documents are then used to enter the requirements disposition data onto the OHMIS computer data base. For Reminder Notice type suspense data only the date of the disposition and the type of disposition (i.e., the first two data elements) are entered and the requirement implementation data (DS5) is deleted after these entries. That is, the entry of these two data elements is the way that the user tells the program to delete the DS5 data. For all other types of DS5 data, the DS5 data is maintained indefinitely even after the requirements disposition information has been entered. The entry of complete disposition data (i.e., including requirements approvals, if needed) also results in the deletion of the specific task scheduling data (DS24) for the task that was scheduled as a result of triggering the requirement. This is true for all types of DS5 data. The DS24 data is deleted after the entry of all disposition data onto the DS5 data set, because the entering of disposition data on a requirement is the way that the user shows that the task associated with the requirement (as identified by the task type code (CT8) on the requirement description data (DS1) or on the requirements suspense data (DS4) for tasks triggered by Reminder Notice suspense data) has been completed and that, therefore, the task should be deleted so that it does not remain on the monthly schedule data (DS27).

21. The date that the disposition of the requirement was executed.
22. The disposition of the requirement. Four answers are possible: (1) The requirement was fully completed; (2) The requirement was partially completed; (3) The requirement was aborted, i.e., the user decided not to implement the requirement for some reason; (4) The requirement was found to be not applicable for some reason.
23. A description of what part of the requirement was implemented, if the disposition was "partially completed".
24. A description of the rationale for the disposition of the requirement, if the requirement was not fully completed.
25. The employee identifier (ID4) of the person who executed the disposition of the requirement.
26. The OHMIS user identifier (ID13) or OHMIS position identifier (ID14) for the person who executed the disposition of the requirement, i.e., either completed it or

## DATA SET 5

determined not to complete it. This data is obtained from the current user/position identity and address data (DS9) for the employee identifier given above. This identifier should match the identifier given above which specified the user/position that is supposed to have executed the requirement; if it does not, the following data element is requested: the explanation for why a person other than the specified person above executed the requirement. If no user/position was given above for the person who is supposed to execute the requirement, then this data element does not need to match that given above or can be blank.

27. Date that the disposition of the requirement was approved. If approvals are required, the requirement is not considered to have been executed until this date and the employee identifier of the person approving the disposition is entered. That is, information on the approval of the disposition of the requirement may be entered at a later date than information of the disposition of the requirement and it is not until this approval information is entered that the requirement is removed from the outstanding requirements list (DL3), and the specific task scheduling data (DS24) for the task involved in executing this requirement is deleted.
28. The employee identifier (ID4), if any, of the person who approved the disposition of the requirement.
29. The OHMIS user identifier (ID13) or OHMIS position identifier (ID14) of the person that approved the disposition of the requirement, if the need for such approval was prescribed. This is obtained from the DS9 data associated with the above employee identifier (ID4). This must match the user/position identifier given for this approval of dispositions in the same way as that explained for the match for the person who executed the requirement.
30. Document identifiers (ID3) or completed forms identifiers (ID18) for the document(s) which provide additional information about the disposition of the requirement. For example, if the requirement was to implement a preplacement physical exam, the completed forms identifier of the exam would be entered here. Up to five identifiers can be entered here.

## DATA SET 6

### Triggering Step Requirements Implementation Unit Identifier Types Data

This set of data identifies the identifier types (or data element types) that are the requirements implementation units for a given triggering step. Requirement implementation units are the person or thing for which a requirement may be implemented. For example, in a requirement to conduct medical surveillance for a given employee, the identity of the particular employee for which this type of requirement is being implemented would be the requirement implementation unit for that implementation of the requirement. Similarly, a requirement to conduct an Industrial Hygiene Survey of a particular facility would have the identity of the facility as the requirement implementation units for that implementation of that type of requirement.

For information triggered requirements (i.e., those based on information triggered requirements applicability data (DS3)), the requirement implementation units are identified during the execution of the triggering step as entries made during the triggering step. Because a particular triggering step will only have certain specified data elements entered during the step, it is possible to identify the types of data elements (most of which will be identifiers in a triggering step, the values for which will be the requirement implementation units entered for a particular execution of the triggering step. The DS6 data lists these identifier types or data element types. This data is thus entered by the OHMIS system designer at the time that the triggering step is programmed, i.e., at the time that a particular data entry step in the OHMIS computer programs is designated as a triggering step.

There can be up to five identifier types (and/or data element types) entered during a triggering step, the values for which constitute the requirement implementation units for a particular execution of the triggering step. A triggering step may have additional data element types entered beyond those that are designated as requirement implementation units.

1. Triggering step identifier (ID2). A unique value that distinguishes the triggering step for which requirement implementation unit types are being identified.
2. The identifier type code (CT10) or data element type code (CT4) for requirement implementation unit type 1, 2, 3, 4, and 5. A specific unit type number is arbitrarily assigned to each identifier type (or data element type) that is to be designated as a requirement implementation unit for the triggering step. This enables a link to be established between the unit type number (1-5) and the identifier or data element type and later the values for the identifier type, i.e., the identifier or the values for the data element type that are entered during a particular execution of the triggering step.

## DATA SET 7

### Data Element Type Information

This set of data provides information about a given data element, i.e., about an individual piece of information contained in the OHMIS data base. Examples of data elements include date of birth, sex, a test result (e.g., for a medical exam or an Industrial Hygiene survey sample test), a description of an illness or medical treatment, a dimension of a facility, a characteristic of a hazard, etc. The name or code number of an item (e.g., of a disease or chemical) is not a data element. Names and identifying numbers are referred to as identifiers and are treated differently than data elements.

Data Set 7 provides information about one particular data element type. This Data Set is not generated by the user. It is generated by an OHMIS program designer (systems programmer). Users may request new data element types, but, in order to maintain the integrity of the OHMIS data base (e.g., avoid having large numbers of data elements that are not mutually exclusive or distinctions that are not parallel), a new data element can only be created by a program designer. New data element types are added centrally. The program designer assigns a data element type code number (CT4) and inputs a set of DS7 data on each new data element type.

A given data element type will have one meaning and will be used in the same way throughout OHMIS, i.e., in all OHMIS Service Areas. An individual Service Area may request that a new data element type be added, if, for example, a special piece of information is needed in the Service Area. However, once the data element type is created, it will be available for use by all Service Areas, i.e., even though only one Service Area may use the data element type, it will become part of the central "bank" of data element types that all OHMIS users can employ and no other new data element type will be generated that conflicts or overlaps with the meaning of an existing data element type. The OHMIS Users' Procedures Manual (as described in Section 6.1) will provide guidelines for users on how to request that a new data element type be added to OHMIS and for program designers on how to add a new data element type by generating a new set of DS7 data.

Once a set of DS7 data has been generated for a particular piece of information (a particular data element), that type of information becomes one of the types of information that can be entered onto the OHMIS data base. The particular data element type is referred to by the data element type code number (CT4) assigned to it. As a designated OHMIS data element type, that type of information may be included as one of the data element types on an OHMIS form designed by an OHMIS user. Thus, while an OHMIS user shall not generate a new data element type, the individual user may design a wide variety of data entry sheets (referred to throughout this report as 'OHMIS forms') using a combination of existing data element types. (See DS10, OHMIS Forms Description



## DATA SET 7

Data, and DS11, Forms Subpart Data, for information about the design of new OHMIS 'blank' forms by OHMIS users.) The data elements types described in DS7 data thus become the 'building blocks' through which OHMIS users design OHMIS forms, tailoring these data entry sheets to meet their individual needs. (Restrictions on the number and types of OHMIS forms that may be developed by OHMIS users at various organizational levels may also be instituted to the degree desired.)

DS7 data is added, corrected or examined through Menu Selection Sequence 5. DS7 data cannot be added, deleted or changed by an OHMIS user. OHMIS users may only examine this information. OHMIS program designers may add or correct DS7 data. It is anticipated, however, that changes to DS7 data will only rarely (if ever) be made, because a change would require a complete review of the entire OHMIS data base to make all of the changes needed to ensure that the change in the DS7 data is incorporated at every point in the OHMIS data base at which the data element type is used. Instead, in most cases when there is a problem with a set of DS7 data, it will be deactivated, i.e., removed from the list of data elements that users may employ in the development of new OHMIS forms and replaced on existing OHMIS 'blank' forms (i.e, DS10 and DS11 data) with a new data element type (i.e., one with a new data element type code number) that does not have the problem. The OHMIS data base is designed so that a change on an existing OHMIS 'blank' form can be made centrally and, in most cases, will be transparent to the local user.

1. Data element type code number (CT4). A unique code number assigned to each new data element type to distinguish it from other data element types.
2. Name of the data element type. The short description of the data element type.
3. Detailed description of the data element type. This description will provide sufficient information for the exact meaning and distinctions about the data element type to be thoroughly understood by the reader.
4. Whether this data element type has been deactivated.  
Answers: Yes/No. Deactivated data element types will not appear on any lists generated for OHMIS users to examine data element types. (Only program designers will have access to these sets of DS7 data.) Also, the users will not be allowed to use deactivated DS7 data sets in the creation of new forms subpart data (DS11) done as a part of designing a new OHMIS form (DS10).
5. Identification of the editing subroutine applicable to this data element type. It is anticipated that there will be a series of subroutines that provide the input program logic for editing data onto the OHMIS data base. These program will evaluate a data entry for a given data element type and determine whether the input is an acceptable value. It is

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expected that in many cases the same editing subroutine can be used for more than one data element type, because the program logic for conducting the editing checks will be the same, even though the exact acceptable values may or may not be different for different data element types. For example, all data element types that have acceptable answers of 'Yes/No/Unknown/Not Applicable' can be edited in the exact same way and using the exact same acceptable values. Similarly, all data element types that have entries that are numeric and consist of a defined range of acceptable values (e.g., 1-99, 1-9, 1-4, etc.) can be edited using the same logic but will require different acceptable values. Because of this similarity in the editing requirements of many data element types, the DS7 data set will include a variable indicating to which editing subroutine (if any) the OHMIS program should "Go To", when conducting an editing check on the entry of the data element described by the DS7 data. The DS7 data also includes some of the specific characteristics of the acceptable values that only apply to the particular data element covered by the DS7 Data Set. (The specifics are given in the items below.) The inclusion of this editing information on the DS7 Data Set will mean that in many instances a new data element type can be added without any additional programming. The program designer will only be required to enter a new set of DS7 data. Occasionally, a new editing subroutine will need to be added to edit an unusual data element.

With the editing information provided on the DS7 data, the input program logic will work as follows: The data element type code number in a given field (e.g., on an OHMIS form or other input format) indicates what data element type is to be entered. When a particular value for a data element is entered (either by a user entering data from an OHMIS form, by entry from an External Data Source or by entry using a specially designed input program), the program will use the data element type code number to identify the DS7 data corresponding to the type of data element to which the value being entered belongs. From the DS7 data the program will determine which editing subroutine is to be used to evaluate the input of the data. Before going to the subroutine, the program will capture the specific editing values that define the acceptable values for the particular data element (given in the items below). The program logic will then go to the editing subroutine and determine if the input "passes". The program logic that the program will use to respond to a failure to pass the editing requirements will depend on the type of input program being used. For example, an interactive input program (such as the input of data from an OHMIS form) would probably stop at each input, complete the editing check and request re-entry for those data elements which fail to pass the editing requirements; a batch processing input program (such as input from an External Data Source) will probably conduct the editing after all entries of a given

## DATA SET 7

kind have been completed, only place the data elements that pass the editing checks into a permanent storage file and generate an error list for the data elements that failed to pass.

6. Field size for the data element type covered in this DS7 Data Set.
7. Type of data (alpha, numeric, alpha/numeric) for the data element type.
8. For data element types that have numeric values:
  - a. Whether or not the value is a number, i.e., a value that can be manipulated (e.g., added, averaged, etc.) or is a code number (e.g., acceptable values are 1-4 which are the codes for the words 'Yes/No/Unknown/Not Applicable') which cannot be manipulated.
  - b. Whether the value is date. The editing for dates is so similar that it is efficient to identify data elements that are dates and treat them separately.
  - c. The lowest value in the range of acceptable values for this data element type.
  - d. The highest value in the range of acceptable value for this data element type.
9. For alpha or alpha/numeric values: the identification of the table (if any) containing the acceptable values for the data element type.
10. Up to 6 identifier type codes (CT10) for the type of unit(s) which is described by this data element. Most data elements will describe the characteristics of a person or thing. For example, 'date of birth' describes the age of a person. 'Date of construction' describes the age of a facility. This item in DS7 identifies what type of unit (e.g., an employee, a facility, a job class, a hazard, a corrective action, a disease or illness, etc.) is described by the values for the data element type described in this set of DS7 data. In most cases a data element type will only describe one unit and only one unit type will be given in this field in DS7. However, some data element types describe the relationship between data elements. For example, data describing an exposure to a hazard may be said to be describing the characteristics of the relationship between an employee, a hazard, and a facility (three types of units constitute the units described by an exposure value). A thorough study has revealed that such relationships can be described using six or less units. This is the reason that DS7 allows for up to 6 types of units to be identified. The information about the unit type described

## DATA SET 7

by the data element and the next item (below) about the number of values of the data element type for a given unit are important for storing data of the type described in a particular DS7 data set.

11. Whether or not there can be more than one value for this data element type for a given unit described. Answers: Yes/No. For example, a person (i.e., a given unit) can only have one date of birth. This would be referred to as a 'one-time data entry', because there can only be one valid value for this data element type for any given unit described by this data element type. However, a person may have more than one hearing test result. Similarly, although a person has only one valid value for his/her weight at any given point in time, a data base can contain more than one value for a person's weight over time, because values change. These are referred to as 'multiple entry' data elements.
12. The location in which a value for the data element type is to be stored. This information will depend on the files and storage configuration selected for OHMIS. However, it is anticipated that the storage will be keyed to the type of unit described by the data element type.

## DATA SET 8

### Values Data for Requirement Applicability Characteristics

This data describes the values of the data elements describing the characteristics of the requirement implementation unit(s) that have been determined to be applicability variables for a particular execution of a triggering step and for a particular potential application of a requirement. This data corresponds to the requirements applicability data (DS3). While the DS3 data prescribes the types of data elements and values that constitute on set of applicability variables for a requirement (including the applicability variables for the requirement implementation unit itself and for the applicability characteristics), the DS8 data describes an actual set of values for applicability characteristics data element types for a particular execution of a triggering step and for a particular execution of a requirements check request. That is, if the actual values in the DS8 data match the prescribed values given for a particular application of a particular requirement type in one of the DS3 data sets, then that requirement referenced in the DS3 data is considered to be applicable and is implemented through the generation of requirements implementation data (DS5). For example, if the DS3 data specified that a particular employee (where the employee was a requirement implementation unit) had to be a certain age (the applicability characteristic for the requirement implementation unit) for a particular requirement triggered by a given triggering step to be considered applicable, the DS8 data would provide the age of that particular employee at the time that the triggering step was executed. If it were found that the age given in the DS8 data matched the age given in a set of DS3 data, the requirements specified in the DS3 data would be found applicable and this would trigger the implementation of the requirement.

The DS8 data is obtained by the computer program for those data elements which the OHMIS data base already contains at the time that the triggering step initializing the need to determine the applicability of requirements is executed. If all of the data is available on the OHMIS data base at that time, the computer automatically makes the requirements check (i.e., determines that the values in the DS8 data set matched the values for any DS3 data sets for the same triggering step; if so, these values are entered on the requirements implementation data (DS5) and the DS8 data is erased. If there are data element types for which the values are not currently available in the OHMIS data base at the time that the triggering step is executed (i.e., the OHMIS program cannot obtain these values automatically), these data element types are copied onto the list of requirement applicability characteristics for which values are missing (DL5); this list is used to tell the user of the missing values using a Requirements Check Notice (01). These missing values are entered onto the DS8 data set by the user at the time that the requirements check (Menu Selection Sequence 1.2.3; Function F2A) is executed. At that time, the user provides the values for the applicability characteristics that were missing from the OHMIS data base at the time that the triggering step was executed.

## DATA SET 8

1. Requirements check request identifier (ID1) for the particular execution of the triggering step that prompted the search to determine whether any requirements are applicable. Provided by the program. This is the same value that is on the requirements check request data (DS2).
2. Requirement application identifier (ID5) for the particular potential application of a requirement (i.e., the set of DS3 data) for which this DS8 data provides the values for the applicability characteristic types applicability variables. This data is provided by the program.
3. The requirement identifier (ID6) given on the requirement applicability data (DS3) referenced by the above requirement application identifier (ID5).
4. Requirement implementation identifier (ID9). If the values in this DS8 data set match the values prescribed in a set of information triggered requirements applicability data (DS3), the requirement will be triggered and monitored for implementation. This will be done by generating a set of requirement implementation data (DS5). If DS5 data is generated for this requirement, the ID9 which identifies that requirement implementation data is entered here. The identification of the DS5 data is needed during the requirements check before the DS8 data is erased.
5. The value of applicability characteristic type 1 for requirement implementation unit type 1. This is the value that the data element type specified in the requirements applicability data (DS3) for the above referenced requirement application (ID5), as the first type of applicability characteristic of the first requirement implementation unit, has for this particular execution of the triggering step in which this set of DS8 data was generated. For example, if the first requirement implementation unit was an employee and the requirement applicability data specified that the first applicability characteristic that the employee must have for the requirement to be considered applicable was to be a certain age, then the value entered here would have the age of the particular employee for which the above referenced requirements check request was generated, i.e., the age of the employee that was the requirement implementation unit for this execution of the triggering step.
6. Values of applicability characteristics types 2-5 for requirement implementation type 1.
7. Values of applicability characteristics types 1-5 for requirement implementation units types 2-5.

## DATA SET 9

### Current User/Position Identity and Address Data

This data identifies the current person who is acting as a given type of OHMIS user or filling a given type of OHMIS position and provides the mailing address information about that person. Many of the requirements data sets and other functions of OHMIS depend on knowing who is currently filling a given OHMIS user/position office. However, it is not desirable to enter the identity of this person on all of the data sets in which this information is used, because this would mean that many data sets would need to be changed, whenever the person filling the OHMIS user/position office changed. Instead, whenever possible, users and positions are referred to by their user type code (CT1) or position type code (CT2) or by their OHMIS user identifier (ID13) or OHMIS position identifier (ID14). In these instances, whenever the program reaches a function requiring knowledge of the current identity of the person filling the OHMIS user/position, the program refers to the DS9 data for that user/position identifier (ID13/ID14) to identify the person currently filling the user/position. (If only the user/position type code (CT1/CT2) is known, the program uses the OHMIS user/position identifier (ID13/ID14) by OHMIS user/position type code (CT1/CT2) list, i.e., the DL8 list and the OHMIS user/position identifier (ID13/ID14) by OHMIS service area (ID10) list, i.e., the DL6 list, to first identify the ID13/ID14 and then refers to the corresponding DS9 data to identify the employee identifier (ID4) of the current person filling the OHMIS user/position.)

As there can only be one person at a time filling a given OHMIS user/position identifier (ID13/ID14), the program can identify the employee identifier (ID4) for the one current person corresponding to an ID13/ID14. Only the current DS9 data is maintained, however, and, therefore, any data sets that require maintaining historical data on the identity of the persons filling a given OHMIS user/position (e.g., the requirements implementation data (DS5)) must store the employee identifier as well as the OHMIS user/position identifier.

DS9 data is similar to the contact and location data (DS28) in that both sets of data provide address data. However, the DS9 data is limited to the OHMIS users and to the OHMIS positions that play an active role in using the OHMIS data base or in executing occupational health program functions. The DS28 data covers contact and location data for all other employees and for selected things (e.g., facilities).

DS9 data is entered by the user using Menu Selection Sequence 8.1.1. As only one set of DS9 data should be in the system at any given time for any given OHMIS user/position identifier (ID13/ID14), the DS9 entering program should check for already existing DS9 data for the ID13/ID14 on which the user is entering DS9 data; if such a set of DS9 data is found, the program should inform the user and ask whether the user is entering a replacement value for the existing DS9 data for the ID13/ID14 (in which case the program should delete the existing DS9 data and continue) or whether the user unintentionally entered the ID13/ID14 in which case

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the program should stop. The user may interchange and delete the DS9 data.

1. OHMIS service area identifier (ID10) for the area in which this set of DS9 data applies.
2. OHMIS user/position identifier (ID13/ID14) for which this set of DS9 data applies.
3. OHMIS user/position type code (CT1/CT2) for the above ID13/ID14.
4. Employee identifier (ID4) for the current person filling the above referenced user/position identifier (ID13/ID14) in the above referenced OHMIS service area (ID10).
5. Work address data for the above employee identifier. This information could include the title of the employee, the mailing address and phone. The mailing address can be the type appropriate for mailing internal to the Department of the Army, e.g., an office identifier and mail stop number.



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### Forms Description Data

This data describes the contents of a form, i.e., the data element types in a form. The data element types are defined by identifying up to twenty-five sets of forms subpart data (DS11). Using the DS10 data a separate version of the same form type (CT9) can be generated for different OHMIS service areas (ID10) and for different applications of the form, e.g., the version of a pre-employment physical type of form may be different depending on the job class to which the employee being hired will belong.

The DS10 data is entered by the user using Menu Selection Sequence 2.1.2. The DS10 data prescribes a record length and composition for all data entry forms used in OHMIS. Therefore, in order to maintain the integrity of the data base, historical DS10 data is maintained. DS10 data cannot be changed (except for the narrative portions such as instructions and subtitles) and is not deleted, although it can be deactivated, i.e., an indication that this version of the form is no longer to be used can be made by supplying an end date for the data set.

1. Forms specification identifier (ID16). Unique value assigned by the program to distinguish this set of DS10 data.
2. Form type code (CT9) indicating what type of form this is (e.g., medical history, hazard survey, etc.).
3. OHMIS service area identifier (ID10) for the service area specifying this version of this form type.
4. OHMIS user identifier (ID13) of the person specifying this version of the form.
5. Employee identifier (ID4) of the person specifying this version of the form.
6. Start date for this version of the form, i.e., the date that this version of the form was specified or the date that it can first be used.
7. End date for using this version of the form (deactivation date). Can be blank if the form is still active.
8. Is this a "default" version of this type of form for this OHMIS service area? Answers: Yes/No. Using the prescribed forms applicability values data (DS13), the user will indicate the applications of this version of the form type, e.g., in the above example the user would indicate for what job classes this version of the form is to be used. In order that the applications data not have to be comprehensive, there will be a default version of each type of form (CT9) for each OHMIS service area (ID10) which will be used if

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there is not other form that meets the applicability values for the form type and OHMIS service area. The user may elect to use this version of the form at any time.

For any point in time there can only be one active default version of a particular form type (CT9) for a particular OHMIS service area (ID10). If the user answers this question "Yes", the entry program will check that there is currently no other active default version of this form type for this OHMIS service area before proceeding. If there is, the program will tell the user and ask the user if the user wishes to change his answer (i.e., not call this set of DS10 data the "default" version) or to deactivate the existing default version. If the later, the program will supply the current date as the deactivation date for the existing (old) default version; remove the forms specification identifier (ID16) for the old default version from the list of the active default forms specification identifier by form type code and OHMIS service area (DL21); continue to generate the new DS10 data as default data; and add the above identified forms specification identifier (ID16) for the new DS10 default version to the DL21 list.

9. Supplemental title of form. The vocabulary word/phrase associated with the form type code (CT9) given above is part of the title of the form; however, the data element listed here provides any additional subtitles identifying this version of the form.
10. General instruction for using the form. This is narrative data.
11. The identifier type(s) (CT10) (or data element type (CT4)) for the up to nine types of identifiers for which the data on this form will prescribe characteristics; these are referred to as forms units. Such identifier types include employee identifiers, facility identifiers, hazard identifiers, job Class identifiers, etc. (see the identifier (ID) list for most of the types of identifiers that will be used in OHMIS.) This data indicates the type of unit that is to be described in the data given on this form. For example, a form that is a medical exam would have an employee as the type of forms unit (type of identifier) being described in the data on that form. A form for conduction a hazard survey of a facility would have "facilities" as the type of forms unit. Data about the characteristics of a particular type of hazard (e.g., material safety data sheet type of data) would have the hazard type as the type of identifier being described, etc. Some forms will have multiple types of forms units. This can be either because the different forms subparts on a single form refer to (i.e., provide data on the characteristics of) different types of units; and/or, because

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some of the individual forms subparts refer to (i.e., provide data about) combinations of units. For example, hazards data often describes the characteristics of a combination of a hazard, an individual employee and a facility; some corrective actions data (such as personal protective equipment) may describe the characteristics of an individual employee and a hazard, etc. For these reasons, up to nine types of identifiers can be given as forms units on an OHMIS form.

It is essential that the identifier types given here are correct for (consistent with) the data element types in the forms subpart data (DS11) specified below. Each of the forms subparts may have a forms unit which that individual forms subpart describes. The type of unit or combination of units are given in the DS11 data for the forms subpart. It is essential that the forms unit for a given forms specification (DS10 data) include all of the forms units for all of the forms subparts included on the form. (in many cases more than one form subpart on a form will refer to the same forms unit as being the unit that the forms subpart data is describing.) The program checks for this internal consistency requirement when the forms unit types are entered.

Not only are there forms units for most of the forms subparts included on a form, there may be forms units for the form specification as a whole. These are used when specifying allowable limits for the form-as-a-whole (as explained below). The link showing which forms units refer to which forms subparts is given below. The link showing which forms units refer to the form as a whole is given here in the form of a Yes/No answer next to each forms unit. Just as each type of forms unit may refer to more than one forms subpart, so a type of forms unit may refer to both the form as a whole and a form subpart.

The conventional use of allowable limits specifies limits for specific data element types such as a limit for a particular type of test or sampling result. These types of allowable limits are given in OHMIS. In addition, however, OHMIS allows the specification of an "allowable limit" on forms-as-a-whole. It should be recognized that in OHMIS an allowable limit (or unallowable limit) is specified when an action or requirement should be triggered if the limit is reached or matched. In some cases requirements should be triggered by the mere fact of entering a certain class of data (or entering that class of data at a certain frequency). For example, a user may wish to trigger a requirement whenever data on a hazardous substance spill is entered or if such data is entered more than 'X' times in a given time span for a given facility. In these instances the allowable limit

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does not apply to any individual data element entered, but to the mere fact of entering data of a certain class. For allowable limits of this type, the user specifies limits for the class of data, where the class of data is identified by the type of form (CT9) (not the version of the form). In the above example, each time data for a report of a hazardous substance spill type of form (the type of form to be used to report spills and other events/accidents involving hazardous substances) was entered (regardless of the values entered on the form), the program will check for allowable limits for this class of data.

As with the more conventional allowable limits, there may be applicability factors (some of which are forms units) and values which determine which allowable limits are to be used. There will also be a type of forms unit (or combination of forms unit types) to which the class of data refers and which is used to define the allowable limit. In the above example, the user may wish to specify that there can be no more than 'X' reports of hazardous substance spills entered onto the OHMIS data base for a given organizational unit or for a given facility. In these examples the organizational unit and/or facility becomes the forms unit for the form-as-a-whole (i.e., for the class of data that is defined by the form type (CT9) ). The user can then specify allowable limit applicability characteristics (on the DS15 and DS16 data) about these forms units, e.g., that the number of persons working in the facility determines which allowable limit is to be used for this class of data. The forms units are then also used to define the allowable limit, e.g., the allowable limit in the above example becomes: "'X' number of hazardous substance spill reports is entered for a single facility (forms unit) having the allowable limit applicability characteristics specified for this data".

In this DS10 data element the user identifies these forms unit(s) for the form-as-a-whole using the number of the order in which the form unit appears on this specification of the form, i.e., numbers from 1 to 9. There can be no more than 6 forms units identified as the combination of units that apply to a form-as-a-whole; in most cases, there will probably be only one.

It should be noted that for both forms subparts and forms-as-a-whole, the types of forms units used to define the allowable limit must be one of the data element types (CT4) or identifier types (CT10) entered on the form, i.e., included in the questions asked on the data entry form and entered as a part of the completed forms data (DS14). In the above example, if the allowable limit is defined as "'X' numbers of hazardous substance spill reports for a single facility" then the identity of the facility must be

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entered on the form as a forms unit. Similarly, for a more conventional allowable limit, if the allowable limit is defined as "X number of millirems of radiation exposure for a single employee" the identity of the employee must be on the form used to enter the data on exposure as a forms unit.

On the other hand, the allowable limit applicability characteristics of these forms units (such as stating that the population in the facility determines which allowable limit will be used for the number of reports of hazardous substance incidents that can be entered without triggering the requirement associated with the allowable limit or that the sex of the employee determines which millirem of exposure limit will be used for the allowable limit) do not have to be entered each time the form is completed; the OHMIS program can abstract the values for these applicability characteristics specified in the allowable limits applicability data (DS15 and DS16) for the forms unit entered onto the form.

12. Up to 25 sets of the following three data element types. These sets of three data element types indicate the contents of the form, i.e., the data element types (questions) that are to be asked for on the form. The number in the sequence of sets (i.e., the number 1 through 25) is maintained in the data base so that the order in which the data elements (questions) are to be printed onto the form is captured. (If the user wishes to specify a form with the same data elements but in a different order, this would be done on a different set of DS10 data with another forms specification identifier (ID15).)
  - a. The forms subpart identifier (ID17). This identifies a series of up to six data elements (with any subtitles, instructions and the actual wording of the question on the form) that are given on the form subpart data (DS11).
  - b. The number of sets of the DS11 data identified above for which data entry spaces are to be provided.  
Answer: from 1 to 99. Answers of greater than 1 are given in this field when the form being described in this DS10 data set is to provide data entries for a series of data elements all of the same type, i.e., all with the same form subpart identifier (ID17). For example, if the form being designed by this set of DS10 data was to be used to list the identifiers for the employees attending a training session, the user would list in the field above the forms subpart identifier (ID17) corresponding to the data entry of employee identifiers and in this field would reference the number of sets of employee identifier data (i.e., the

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number of sets of forms subpart data) the user expects to use to enter all employee identifiers on any given use of this form. Another example would be a form designed to record exposure data for a series of hazards. The user would select in the field above the forms subpart identifier (I017) for the forms subpart containing the data elements needed to enter exposure data on hazards. Then in this field the user would enter the number of sets of this form subpart data needed to enter the expected number of hazards that would be described on any one form.

- c. The information identifying the form unit(s) for the above referenced forms subpart, i.e., the information identifying which identifier type(s) or data element type(s) this form subpart will be describing by providing space for information on the form being prescribed in this DS10 data set. This information can be given in one or both of the following two ways: 1) A number(s) from 0 to 9 indicating which of the above referenced forms unit identifier types the data element types in the above referenced forms subpart are describing. The value '0' would be added if the forms subpart does not describe any type of identifier. (This would have been indicated on the forms subpart data (DS11)). However, if the data provided in the forms subpart is to be evaluated for allowable limits (see Function F3B), the type for form unit identifier described by the data in this form subpart must be identified. (2) A number from 1 to 6 indicating which, if any, of the up to six data element types in the forms subpart referenced above is to be treated as the forms unit for this subpart.

The ability to identify forms units in these two ways is provided for in order to give the user greater flexibility in designing forms. For example, a form consisting of information about an employee (such as a pre-employment physical) would probably have the forms unit for most or all of the forms subparts on the form as an employee identifier and this would be entered once (at the top of the form) as one of the up to 9 form units identifiers that apply to the entire form. This would be using method (1) for identifying forms units for a forms subpart. However, for a form that was organized to allow input of exposure data for several different hazards or large numbers of hazards it may not be convenient to have the form units (i.e., the identifiers for the several different hazards) listed as forms units at the top of the form and covering the entire form, especially as only 9 such forms units could be used, i.e., only 9 different

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hazards could be described on a single form. Instead the user may wish to organize the form so that the hazard identifier (i.e., the forms unit) is the first data element type in the forms subpart data itself and this is followed by the hazard exposure data as a part of the same form subpart. In this case the user would be using method (2) for identifying the forms units for a forms subpart. This method would enable the user to enter as many as 2475 sets of hazard exposure data each for a different hazard and each having a different forms unit. (there can be up to 2475 form subparts on a single form by prescribing a form with the full 25 different subparts and the full 99 sets of the same form subpart for each of these 25 subparts; this type of organization of a forms design would obviously only be used for a form that was primarily used to list large numbers of the same type of information, e.g., a list of all hazards found in a facility or a list of all employees in a facility.)

To enter this forms unit information for a form subpart, the user must first indicate what method is being used (method (1) or (2)) and then what the value for the forms unit is, i.e., 0 to 9 for forms unit identified at the top of the form and 1 to 6 for forms units that are a data element type in the form subpart. Up to a total of six forms units may be identified for each forms subpart, although in most cases there will be only one forms unit. The reason why there may be more than one forms unit being described by a set of forms subpart data is that some types of data describe a relationship between identifiers. For example, exposure data could be said to describe the relationship between an employee, a hazard, and a facility; in this case there would be 3 forms units, i.e., 3 identifiers for which the hazard exposure data was describing characteristics. The up to 6 forms units for a given forms subpart that identify the item or items that the forms subpart is describing can be identified using one or both of two methods for identifying forms units for a form subpart.

The types of forms unit identifiers specified in this field as being the type of unit which the data in the forms subpart is describing must be consistent with the type of forms unit identifiers given in the forms subpart data (DS11) for the respected forms subpart identifier (ID17). If not, the DS10 entry program will require that either a value of '0' be used (meaning no allowable limits will be checked for this forms subpart data because no forms units have been identified, i.e., no unit about which an allowable limit could be set has

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been identified) or it will require that additions be made to the types of forms unit identifiers given on the DS10 data so that it is possible to reference a forms unit that is the appropriate type of identifier for the forms subpart data being entered.

The values entered in this field (up to 6 values ranging from either '0' to '9' or from '0' to '6') indicates the location (field) that will contain the particular forms unit identifier being described by this forms subpart data. These values link the forms subpart data to the particular order in which the forms unit identifier data corresponding to the DS11 data (on the acceptable types of forms unit) is given. That is, this information indicates the location (field) that will contain the particular forms unit identifier being described by this forms subpart data on the new version of the form being described by this set of DS10 data. It should be recognized that in many, perhaps most, instances there will only be one forms unit identifier (unit being described on a form) for a given version of a form. In those instances the identification of forms units for the various forms subparts that make up a description of a version of a form will be identified very easily as they will be the same for all of the form subparts that make up the form.

In addition to the subpart specified above, all OHMIS data entry forms will have spaces for a series of identification data elements at the top, e.g., the identity of the person completing the form, the date that the form was completed, etc. These data elements are similar for almost all forms and are therefore shown in the generic description of an OHMIS form given in the completed forms data (DS14) description.

13. OHMIS user type (CT1) or position type (CT2) of the type of person who is supposed to complete this form, if any is specified.
14. Whether or not this form is to be reviewed by anyone.  
Answer: Yes/No.
15. OHMIS user type (CT1) or position type (CT2) of the type of person who is to review ('sign off on') this form, if any is specified.
16. Length of time from the date that the blank form is generated to the date that the completed form is due. May be left blank, if unspecified.



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17. Length of time for which the hard copy of the forms of this specification are to be maintained. The value in this field may be zero.
18. Whether or not this is a one time form, that is a form that will be filled out once for a given form unit(s). This could be true because of the nature of the form or because each of the forms subparts on the form contain only data element types that are non changing data element types. The answer given in this field is to designate the form as a 'one time form' or a 'multiple use' form. One time forms are forms that contain data that does not change and for which there cannot be multiple values. For example, a persons date of birth is a one time data element and a form containing only data elements of this type would be a one time form. The reason why a one time form needs to be identified is that the allowable limits evaluation for a one time form will be conducted differently than it will be for a multiple use form because it will not be necessary to compare current entries with previous entries to determine whether an allowable limit has been reached. An example of a multiple use form would be a hearing test form; it is expected that this type of form would be filled out multiple times for the same employee (i.e., for the same forms unit).
19. Whether or not any of the forms subparts included in this version of the form contain data element types of the type that could have base line information, i.e., entry level (pre-exposure level) measures the comparison to which is used to measure changes in or affects of exposures as an employee of the Department of the Army. Such a form would be identified as a 'no base line form' or as a 'base line form'. If the form was designated above as a one time form, then the form is necessarily a no base line form. A hearing test is an example of a data element type that is likely to have base line information on it, i.e., information about the persons hearing before exposure while employed with the Department of the Army. If the form contains any such data element types it would be classified as a base line form type of form.

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### Forms Subpart Data

This data identifies a particular set of up to six data elements that may be used in the composition of an OHMIS form. In addition to providing the data element types (CT4) that will go on a form, this data set provides the subinstruction, subtitles, and exact wording of questions that will be used on an OHMIS form. The DS11 data is used in the forms specification data (DS10) to describe the contents of a form. DS11 data is entered by the user using Menu Selection Sequence 2.2.2.

The same sets of DS11 data, once specified, are used throughout OHMIS. Users from different OHMIS service areas refer to these "standard" sets of data elements to specify the contents of a particular form for use by their respected service area. The same form subpart may be used in more than one form. The DS11 data entry program (Menu Selection Sequence 2.2.2) thus checks to determine if there are duplicate DS11 sets of data already entered on the OHMIS data base. The data element types used by a user to specify a particular form subpart are defined and controlled by the OHMIS program designer (i.e., the software staff) not the user. The DS11 data set merely allows the user to group together existing data element types developed by the OHMIS system, not created new data element types.

In order to preserve the integrity of the OHMIS data base, DS11 data cannot be changed (except for narrative portions such as instructions) or deleted. This data is not dated, i.e., there are no beginning and end dates for this data, because generically speaking this type of data acts as a dictionary (thesaurus or vocabulary set) from which forms are composed.

Some care needs to be exercised in selecting data element types to be grouped together in a given forms subpart. For one thing all of the data elements in a given set of forms subpart data must reasonably be said to describe the same type of unit (or group of types of units), i.e., the same forms units (see below). Also the up to 6 data element types in a forms subpart are treated as a group in evaluating allowable limits (See allowable limits specification data (DS17) and Function F3B.) This has its advantage in that allowable limits can be specified in terms of relationships between the up to 6 data elements in a given forms subpart. However, should the user wish some data elements treated separately with regard to allowable limits, it would be necessary to generate additional sets of DS11 data (with each of the individual or groups of data element types that are to be treated separately on a separate DS11 data set) and to use the forms subpart identifiers (ID17) for these forms subpart data sets when specifying the contents of a form.

1. Forms subpart identifier (ID17). Unique value assigned by the program to distinguish this set of DS11 data.

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2. Subtitle, if any, that goes with this set of data elements (i.e.) this forms subpart data set) when it is printed on a form. (The DS10 data will provide the overall title for the form.)
3. Instructions, if any, that go with this set of DS11 data when it is printed on a form. (The DS10 data will provide the general instructions for the entire form).
4. From 0 to 6 identifier type codes (CT10) or data element type codes (CT4) identifying the types of units described by the data in this forms subpart. These are referred to throughout all data sets as forms units. For example, data about an employee's age and sex on a form would have an employee as the type of form unit being described. Data on the size of a building would have a facility as the type of forms unit. This field can be left blank if there are no types of units being described. More than one type of unit may be described, especially for those data element types that describe characteristics of relationships between identifiers. For example, data on the links of an exposure to a hazard may be said to be describing the characteristics of the relationship between an employee, a hazard, and a facility (i.e., three types of identifiers that constitute the forms units for this data element type). While in many (perhaps most) cases only one type of identifier will be described by the DS11 data, up to six forms unit types have been allowed because an extensive evaluation has shown that this is the maximum credible number of forms units that are likely to be needed to describe the most complex type of relationships between identifiers.

The location of the values for the forms units for a given forms subpart on a set of completed forms data (DS14) are prescribed in versions of a form given on the forms description data (DS10) and linked to the forms subpart data for that specification (version) of the form. The program will check that the types of forms units given in the DS10 data for a particular use of the forms subpart data on a version of a form are consistent with the DS11 data.

5. Data element type code (CT4) for each of the up to 6 data element types that may make up a set of forms subpart data. The sequence (i.e., 1 through 6) in which each of the data element types on the DS11 data is entered is important. It is this sequence that is used in other data sets that is used to identify a particular data element type on a particular set of forms subpart data. Also the order in which the data elements are to be printed out on a form is known from this sequence. The same data element types in a different order would be

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shown on a different set of DS11 data. Similarly, a given data element type may be more than one set of DS11 data (Only the combination of up to six data elements is unique.) The reason why the forms subparts are described in sets of six data element types, instead of individual data element types, is that many times the same group of data elements will be used together, e.g., employee name and Social Security Numbers; visual acuity in the right and left eye; the three dimensions of a facility or object; etc. By referring to the forms subpart identifier (ID17) the user can easily prescribe the contents of a form (in the DS10 data) and ensure that the same format for common groups of data elements is used. Also many times allowable limits can only be specified in terms of the relationships between two or more data elements. As allowable limits are specified for a given forms subpart (see allowable limits specification data (DS17)), this grouping together of data element types is advantageous for allowable limits specification data processing as well.

6. For each of the up to 6 data element types given above, the exact wording of the question or statement that is to appear on printed OHMIS forms for this data element type and is to be used to obtain the information desired when completing the form. Includes special instructions or examples for providing information about the data element type.
7. For each of the up to 6 data element types given above, whether or not the data element is the type for which there can be more than one value, i.e., the type for which the value can change. Answer: Yes/No. This information comes from the data element type information (DS7) data on the data element type. Data element types which cannot change and for which there will not be multiple values for the same forms unit are referred to as 'one time data entries'. An example is 'Date of Birth'; each employee can only have one date of birth and it can never change (although it can be corrected). This characteristic of the data element type is used to determine whether or not to assign a Data Element Sequence Number to each entry of a value for the data element type for a given forms unit. (See description of Data Element Sequence Number on the completed forms data (DS14) description.) Also, although it is possible that a nonchanging data entry will be entered more than once (for example several forms may have a person's date of birth on them) this information informs the OHMIS program about whether to actually enter the data onto the OHMIS data base each time it appears on a form.
8. For each of the up to 6 data element types given above, whether or not this type of data is to be considered to have

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'base line' information. Answers: Yes/No. Answers of 'No' are referred to as 'no base line data entries'. If the answer for the same data element type given above was 'No' (i.e., the data element type is a 'one time data entry'), then the answer in this field must also be 'No' ('no base line data entry'). Base line data is data used to measure the characteristics of an employee or other unit prior to exposure or prior to employment with the Department of the Army. More generically, base line data is the data that is to be treated as the first entry of data of that data element type for a given unit. It is used to compare changes in the values of that data element type for that unit over time. For example, one result of a hearing test (a data element type) for an individual employee (a unit) may be compared to the original hearing test results (base line data) for that employee in evaluating allowable limits. Therefore, hearing test results are the type of data that do have base line information and the answer in the field would be 'Yes'. Base line information about a data element type is entered by the user. If the data element type is a 'one time data entry' (see above), the program automatically designates the data element type as a 'no base line data entry', because obviously the concept of 'base line' is meaningless for data element types with values that cannot change. However, there may be some data element types that do change or that could have base line information, but which the user does not wish to be treated as the type of data element that has base line information when it is used in the forms subpart data described in this DS11 data set.

## DATA SET 12

### Forms Applicability Factors Data

This data describes the types of factors that determine which specification of a form should be used for a particular type of form (CT9) and OHMIS service area (ID10). For example, if a user wishes to use a different pre-employment physical depending on the job class of the employee being hired, then 'job class' would be the factor determining which version of the pre-employment physical should be used. This factor would appear on DS12 data. The data is entered by the user using Menu Selection Sequence 2.3.1.

Only current DS12 data is maintained. The data is undated (i.e., no begin or end dates). There can only be one set of DS12 data for each form type (CT9) and OHMIS service area identifier (ID10) at a time. The new DS12 data is entered (using Menu Selection Sequence 2.3.1) and the program checks to see that the DS12 data for the form type and service area does not already exist. If it does, the program asks the user whether the existing data is to be deleted or changed (Menu Selection Sequence 2.3.2 or Menu Selection Sequence 2.3.3). DS12 data can be deleted or changed provided that the existing forms applicability values data (DS13) that corresponds to the DS12 data, i.e. all applicability values for the same type of form (CT9), is also changed to be consistent with the new DS12 data.

1. Form type code (CT9) for the type of form for which this data is provided.
2. OHMIS service area identifier (ID10) for the service area specifying this data.
3. Identifier type(s) (CT10) or data element type(s) (CT4) for from 1 to 5 types of units about which there are factors that determine the applicability of the form. In the above example where the job class of the potential new hire is the factor which determines which version of the pre-employment physical type of form will be applicable, the unit (type of identifier) would be an employee, because the factor (job class) is a characteristic describing employee. There may be up to five such applicability units determining the applicability of a form. Note: These units are not necessarily the same as the forms unit referred to in the forms subpart data (DS11) and forms specification data (DS10). These units determine the applicability of a version of a form, while the forms units define the applicability of allowable limits for the data on a form and the type of unit being described by the data on a form.
4. For each of the above applicability units (1 to 5), up to 5 data element type codes (CT4) or identifier type codes (CT10) describing the characteristics of these units which

## DATA SET 12

determine the applicability of the form. In the above example, job class identifiers are the type of data element (identifier type) that is the characteristic determining the applicability of the form. There may be up to five such characteristics for each of the up to 5 units referenced above.

## DATA SET 13

### Forms Applicability Values Data

This data prescribes a given set of ranges of values (or identifiers) that determine the applicability of a particular specification of the form. The values data on DS13 matches the format, i.e. the data element types (CT4) and identifier types (CT10), given in the forms applicability factors data (DS12) for the same type of form (CT9) and OHMIS service area (ID10).

There can be multiple sets of DS13 data for a given forms specification (ID16) and OHMIS service area (ID10). If, for example, a particular form specification is applicable if 'A' or 'B' are true, then there would be two different sets of DS13 data (one for applicability value 'A' and one for 'B') each referring to the same form specification identifier (ID16) and OHMIS service area (ID10). If the forms specification were applicable only if 'A' and 'B' were true, this would be shown on the same single set of DS13 data.

However, the reverse is not true. There cannot be the exact same DS13 data for more than one set of forms specification (version) data (DS10) of the same form type (CT9) for a given service area (ID10), nor can the range of values given in one set of DS13 data overlap, e.g., one set of applicability values (DS13) specifies that a forms specification applies whenever the employee is over age 50 while another set of DS13 data says that a different forms specification applies whenever the employee is between age 40 and age 60. The reason these values are not acceptable is that they would mean that the data was stating that more than one different version of a given type of form is applicable in a given circumstance, i.e., the program would not be able to "decide" which form to use. The program checks for this internal consistency problem using the list of forms specification identifiers by form type and by OHMIS service area (DL13) when the user enters DS13 data using Menu Selection 2.4.1.

Only current DS13 data is maintained. DS13 data may be changed (Menu Selection 2.4.3) or deleted (Menu Selection Sequence 2.4.2) as long as it follows the format (i.e., the same set of data element types or identifier types) as that prescribed in the current DS12 data for the form type and OHMIS service area and remains not duplicating or overlapping with a different set of DS13 data referring to a different form version. The DS13 data is undated (i.e., no begin or end dates).

1. Forms application identifier (ID19). A unique value assigned by the program to distinguish this set of DS13 data.
2. Form type code (CT9) for the type of form for which this DS13 data is being given.
3. Forms specification identifier (ID16) for the particular form description (versions shown on a set of DS10 data) for



### DATA SET 13

which this DS13 data describes the form's applicability. That is, this is the version of the form that will be used if the units and characteristics for which the form is being generated match the applicability values given in this set of DS13 data.

4. OHMIS service area identifier (ID10) for which this set of applicability values (DS13) is being generated.
5. The OHMIS user identifier (ID13) for the person prescribing this applicability data for the form.
6. The employee identifier (ID4) for the above person.
7. The range of applicability values or identifiers, if any, for each of the up to 5 identifier types (CT10) or data element types (CT4) which have been identified in the forms applicability factors data (DS12) as being the applicability units for the above referenced form type (CT9) and OHMIS service area (ID10). (See the (information triggered) requirements applicability data (DS3) for a description of how ranges of values are entered.) This data can be blank if this particular application of the form does not depend on a particular type of unit, i.e., it is the characteristics of the unit rather than the identification of the unit that determine the applicability of the version of the form.
8. Same as above (i.e., the range of applicability values) for the up to 5 characteristics of each of the up to 5 units referenced above. For example, if it had been determined that the version of the pre-employment physical type of form to be used depended on the job class for which the new employee was being hired, this data would provide the particular job class or range of job class identifiers (ID7) for which the above referenced specification of the pre-employment physical (i.e., for the above forms specification identifier (ID16)) is applicable. In this example, the applicability values shown above for the type of applicability unit (i.e., an employee) would probably be blank (i.e., no range of employee identifiers would be given above), because it is unlikely that there would be a different version of the form for different individual employees. In other words, in this example it is not the identity of the unit (i.e., the first range of values referred to above) that determines the applicability of the form, but the characteristics of the unit (i.e., this second set of ranges of values).

## DATA SET 14

### Completed Forms Data (Generic Description of 'Blank' Form)

This data set describes the characteristics of a set of data entered for a form generated through the OHMIS system, i.e. for the blank form (output 012) generated in Function F3A from forms specification data (DS10). (See output 012, the OHMIS 'Blank' Form for a generic description of all OHMIS outputs that are forms.) Although, of course, each type of form and each specification for a form will be different, all OHMIS data entry forms will follow a common format. This format is described in the DS14 data. A common format is used in order to allow the user flexibility in generating his/her own forms (see Function 3A) and to enable a single set of data processing procedures for checking data entered on a form to determine if it matches allowable limits to be used for a wide variety of forms.

The data from any completed OHMIS form (i.e., DS14 data) is entered by the user in one program using Menu Selection 3.1. Some DS14 data is derived from the forms specification data (DS10) with a corresponding forms specification identifier (ID16). (See function F3B for the processing involved in entering data for a form; this process includes checking for whether the data entries are matching allowable limits.)

DS14 data is maintained indefinitely. Individual archiving decisions will be made depending on the type of form (CT9) covered by the DS14 data. In some instances it may be required to keep the hard copy of the actual data entry form (012). The length of time for this archiving is given in the DS10 data. DS14 data may be deleted (using Menu Selection Sequence 3.2) or changed (Menu Selection Sequence 3.3).

Although the decision on the file and storage structure for the OHMIS data base awaits the final detailed program design and logic, it is convenient to think of the majority of OHMIS data stored in a structure based on the OHMIS forms generated by the user and defined in the DS14 data set. Thus, for one class of data (for example, data on medical history) there would be a particular type of form (e.g., FT4 medical history form). The user would define the specifications (data elements contained in the form) that make up this form using DS10 data. More than one specification (version) of the medical history form could be specified by the user, if it is desired to have different versions for different users (applicability factors) of the form. Each version of the form becomes a format for the way in which this class of data is stored, i.e., the means of specifying how to locate a value for a specific data element type in the OHMIS data base.

Each form has one or more forms units identified at the top of the form (the beginning of the DS14 data set) indicating what unit is being described by the class of data in the form (e.g., the medical history data would describe an individual employee). For some types of forms it is possible that there would be more than one set of data for a given type of form entered on a given unit, e.g. a civilian DA employee may have medical history data entered periodically to update the OHMIS data

## DATA SET 14

base for treatments and diagnoses received from other than DA medical data on a facility will almost certainly be entered. Thus for a given class of data (medical history data) and a given unit (an employee or a facility) the OHMIS data base may contain a series of sets of data entries. The format for entering and storing each set of data in a series is defined by the version of the form (DS10 data); the generic format for entering Completed Forms Data [Generic Description of 'Blank'] and storing the values of the data from forms is defined in this description of the DS14 data. The ability to refer to a particular set of DS14 data in the series of data for a given class of data and unit (i.e., a particular set of data entered from a given form) is accomplished with the completed forms identifier (ID16). Each set of data entered onto the OHMIS data base from an OHMIS form is assigned an completed forms identifier. (Here the word "form" is used loosely and can be a screen on a computer terminal as well as a hard copy data entry form.) The allowable limits evaluation of data to determine if the data entered on a form matches a specified allowable limit will often involve comparing one set of data in the series (one set of data for a given class of data and given unit) with another set of data in the same series. In order to describe a common allowable limits evaluation for all data, it is convenient to think of each set of data for a form (i.e., each of data of a given class and for a given unit) stored separately as a whole using the structure given in the format of the form by the DS10 data. The use of the device of the format of a form as a means of describing data storage enables the location of the values for any data element type for any particular unit in the OHMIS data base to be defined generically. This is the reason why the description of the completed forms data (DS14) is given; it is the generic description of how any set of data entered using an OHMIS form would be stored. The definition of this "common storage and format" method for almost all OHMIS data enables the processing functions of OHMIS, such as the check for allowable limits and the triggering of follow up actions that result from the entry of a given set of data to also be defined generically.

To avoid confusion it should be noted that the completed forms (DS14) data describes generically a possible storage method of all OHMIS data entered by an OHMIS form, while output 012 (OHMIS 'Blank' Form (generic)) describes the way an OHMIS data entry form would look to a user when presented for data entry. The two descriptions are thus very similar, but serve different purposes; the first (DS14) describes a generic storage method (in order to enable other OHMIS functions to be described generically) and the second 012 describes an output.

### Identification Data

1. Completed form identifier (ID18). Unique value assigned by the program to distinguish this set of DS14 data, i.e., to distinguish a particular set of data entered onto the OHMIS data base from a particular completed form.
2. Previous completed form identifier (ID18). This is the ID18 for the last form entered onto the OHMIS data base for the

#### DATA SET 14

same forms unit identifier (see below) and for the same form type (CT9); need not be the same form specification (ID16)). This identifier is obtained from the current forms list (DL23) at the time that the DS14 data is entered and the above new ID18 replaces this previous ID18 on the DL23.

3. Forms type code (CT9) for the type of form for which data is being entered.
4. Forms specification identifier (ID16) for the particular version of the above form for which data is being entered.
5. OHMIS service area (ID10) for which this form was completed. The program will check that the ID16 and ID10 are consistent.
6. Date data obtained or date of the event covered by the form, e.g., the date that a sample was taken. This is not the date that the form was completed or the date that it was entered onto the computer. In the allowable limits evaluations in which the time span is at issue (e.g., an allowable limit of no more than 'X' entries over a specified period of time), it is this date, not the date that the form was completed or the date that it was entered, that is used. For some form types the time (hour, minute, second) at which the data was obtained may also be entered. This is used in allowable limits evaluations that are specified in terms of a time span of less than a day.
7. Date form was completed.
8. Length of time that the hard copy of this form is to be maintained from the date the data was obtained (above). The data for this field is from the DS10 data corresponding to the above forms specification identifier (ID16). Answer may be '0'.
9. OHMIS user identifier (ID13) or position identifier (ID14), if any, of the person completing the form. The program will check that this person is the same type of user/position (CT1 or CT2) as specified in the DS10 data, if any, and will note that this is different.
10. Employee identifier (ID4) of the person completing the form.
11. OHMIS user identifier (ID13) or position identifier (ID14), if any, of the person who reviewed ('signed off on') this form. The program will check for consistency with the CT1 or CT2 provided in the DS10 data for the person who was supposed to have reviewed the form and note differences.
12. Employee identifier (ID4) for the person who reviewed this form.

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13. Date this form was reviewed or "signed off on."
14. The forms units identifiers (or possibly data element values) of a person or thing (unit) for which the data in this form is being completed. For example, if the form were a pre-employment physical, the unit for which the form would be completed would be an employee identifier (ID4). The DS10 data specifies the type of identifier(s) (CT10) or data element types (CT4) that are to be entered here. Up to nine such identifiers may be entered.

#### Form's Content

15. The values for the data entries on the form, that is the values for the up to 6 data elements on the up to 2475 sets of data, i.e., the up to 99 sets of up to 25 different forms subparts data (DS11) defined by the DS10 as being included on this version (specification) of the form. It is not anticipated that any form will actually have the total length of 2475 forms subparts; and, it is not anticipated that a maximum record length for all forms will be used that is the same for all forms. Instead it is envisioned that the actual length of the record for storing data from a given form specification (form type (CT9) and version (ID16)) will be defined in the DS10 data. This is assuming that the final determination on data storage is to use the format of forms defined in DS10 data.
16. For each of the above values for data element types, the Data Entry Sequence Number. This is the number indicating the frequency and order with which data entries of the same data element type and for the same forms unit identifier have been made. For example, there may be more than one entry of a vision test result (data element type) for an individual employee (forms unit identifier). The first entry ever made to the OHMIS data base for this data element type and for this employee would be assigned Data Entry Sequence Number '1'; the next time this same data element type was entered for the same person, it would be assigned a sequence number of '2', etc. If the forms subpart data (DS11) for this data element type has identified this data element type as a 'one time data entry' (such as date of birth) the sequence number is not assigned. Instead a Data Entry Sequence Number code (e.g., 'X') is used to indicate that this is a type of data element that does not have a sequence of entries for it. If the data element type was not completed for this entry of completed forms data (DS14), i.e., if it were left blank on the particular form being entered in this set of DS14 data, the Data Entry Sequence Number is left blank also (i.e., the sequence number is not incremented). (These missing data elements are entered on the missing data element information (DS19) for use in tracking missing information; the user must

#### DATA SET 14

enter a value, e.g., "unknown" or "not applicable" for the computer program to consider data not to be missing.)

The Data Entry Sequence Number is identified by the program, not the user. It is obtained using the previous completed form identifier (ID18) given above (which in turn was derived from the current forms list (DL23)). Using the two ID18s on each set of completed forms data (DS14), the program searches the previously entered date for the same type of form (CT9) and forms unit identifier in reverse order of the order in which the forms were completed until an entry for the same data element type is found. The Data Entry Sequence Number that was assigned to that data entry of a data element type is then incremented by '1' and assigned to the new data entry for the same data element type and same forms unit identifier. It is possible that there would be no previous entries of the same data element type (on the same type of form (CT9)) for the same form unit identifier. This would be the case if there were no previous forms of this form type (CT9) for this forms unit. It would also be the case if the previous form of the same type and for the same unit was a different version (forms specification as given in the DS10 data and identified by the forms specification identifier (ID16)) for this form type and that version does not include the data element type being entered. Finally, it would be the case that there would be no previous entry of the same data element type for the same unit even if there was a previous form of the same specification, if the user had not completed this data element type on the previous form, i.e., it was a missing data element.

The Data Entry Sequence Number is used to enable comparisons between and evaluation of trends among entries of data for the same forms unit identifier (e.g., for the same employee) as a part of evaluating the data entered to determine if it matches any allowable limits specifications.

17. For each of the above values for data element types that are not 'no base line data entry' data element types (as determined from the DS11 data), whether or not this entry is an original base line value or a 'secondary base line' value. For any value of a data element type entered in OHMIS (except the 'no base line data entry' types of data elements) the value with the Data Entry Sequence Number of '1' is the original base line. If this is a value for a 'no base line data entry' type of data element, then the base line field is left blank. 'Secondary base lines' are assigned by the user. These represent a new base line for a given data element type and forms unit identifier that was completed later than the original base line. An example of the use of categorizing a data entry as a secondary base line would be the

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identification of an appropriate set of base line data for an individual who has been rehired after a long period away from the Department of the Army or has been hired into a very different job. If this was the case, the user may wish to assign the data entry obtained at the time that the employee was rehired as the 'secondary base line' (i.e., the data entry that is to be treated as a base line) rather than use the original base line (the first entry of this data element type for this employee) as the base line. Similarly the user may wish to set a new base line for monitoring changes in amounts of hazardous substances after a major change in hazardous material storage procedures or another major change in corrective actions.

The user indicates that a value for a data element type is to be considered a 'secondary base line' at the time that the DS14 data is entered, i.e., Function F3B. The identification of any previous entries as original base line entries or previous secondary base line entries is retained in the OHMIS data base throughout the system even if several secondary base line entries are identified.

The identification of entries as base line entries (original or secondary) is used primarily to enable the evaluation of allowable limits as many allowable limits are defined in terms of the relationship of an entry to the base line entry of the same data element type for the same unit. The automatic allowable limits evaluation that takes place when data is entered from an OHMIS form, i.e., in Function F3B. Uses either the original base line or the latest secondary base line as the base line entry in the allowable limits check (Function F3C), which allows for a manual evaluation of allowable limits; the user may specify which secondary base line entry is to be used to determine if there is a match to the allowable limit.

## DATA SET 15

### Allowable Limits Applicability Factors Data

This data identifies the factors (data element types) that are to be used to determine which set(s) of allowable limits specification data (DS17) are to be used in evaluating whether a data entry on a form is outside the allowable limits. For example, if an allowable limit for weight of an employee was to depend on a person's age, then employee age would be a factor determining which set of allowable limits should be used. The values for these factors (e.g., the age value that determines the applicability of a particular set of allowable limits) are given in the allowable limits applicability values data (DS16).

Allowable limits specification data (DS17) is provided to cover either individual data elements (e.g., an allowable limit for the weight of an employee), in which case the allowable limit refers to a forms subpart identifier (ID17) i.e., the set of up to 6 interrelated data elements; or an allowable limits specification may refer to an entire form (e.g., an allowable limit on the number of Hazardous Substance Incident Reports that can be entered for a facility without triggering a requirement), in which case the allowable limit refers to a forms specification identifier (ID16).

DS15 data is entered by the user using Menu Selection Sequence 4.2.1. Only current DS15 data is maintained. Data may be deleted (Menu Selection Sequence 4.2.2) or changed (Menu Selection Sequence 4.2.3) provided any existing allowable limits applicability values data (DS16) that corresponds to the DS15 data being deleted, i.e., all applicability values for the same forms subpart identifier (ID17) or forms specification identifier (ID16), are deactivated and new DS16 data is generated that is internally consistent. There can only be one set of DS15 data for a given forms subpart identifier (ID17) (or forms specification identifier (ID16)) and OHMIS service area (ID10) at a time. The program checks for this in the same way described for forms applicability values data (DS12).

It should be noted that it is possible that there are no factors that determine the applicability of an allowable limit, i.e., there is only one set (or only one series of sets) of allowable limits specification data (DS17) for a given set of forms subpart data (DS11) (or forms description data (DS10)) in an OHMIS service area (ID10) and these same limits apply in all cases. For example, if the allowable limit for weight was not dependent on employee age or sex or any other factor there would be no allowable limits applicability factors data for that data element. In this situation, there would be no DS15 data or allowable limits applicability values data (DS16) for the forms subpart in the OHMIS service area. The allowable limits evaluation program (Function F38) would not need to determine which allowable limits were applicable but would use the 'default' allowable limits specification data (DS17) as the allowable limit with which to compare the data entry in order to determine if allowable limits have been reached.



## DATA SET 15

It should be noted that the DS17 default data is different than the default data for forms (i.e., the default DS10 data). Because there must be an applicable form of each type of form for each OHMIS service area, the default DS10 data is used both when there are no forms applicability data (DS12 and DS13) given (because the same form is used for all applications) and when none of the forms applicability data given are found to match the specified values for the forms applicability characteristics. This is because there must be a default DS10 data for each form type and OHMIS service area. There need not, however, be any allowable limit (DS17 data) for a form subpart and OHMIS service area. This means that there need not be a default DS17 data for each forms subpart (or form) and OHMIS service area; and if there is a set or series of sets of default DS17 data it is used only when there is no other set of DS17 data, i.e., no 'nondefault' DS17 data for the forms subpart and OHMIS service area. That is the default DS17 data is used only when there is one and only one set of allowable limits for a form subpart (or form) and OHMIS service area and this set of allowable limits applies in all cases. Unlike the DS10 default data, the DS17 default data is not used when no match is found to the prescribed allowable applicability characteristics data (DS15 and DS16); if no match is found between the applicability characteristics of the allowable limits data being entered and the prescribed allowable limits applicability values, it means that there are no allowable limits (i.e., values that trigger a requirement) which apply to the forms subpart (or form) and OHMIS service area for which the allowable limits evaluation is being made.

There are several possible relationships between allowable limits applicability factors and values (DS15 and DS16) data and allowable limits specification data (DS17). For example, if there was a weight limit of less than 200 pounds and this applied regardless of what the characteristics of the employee were, then there would be no DS15 and DS16 data describing the characteristics the employee must have (i.e., the applicability characteristics and values) for the weight limit to be applied and the program would use the 1 limit (less than 200 pounds) in all cases. This limit would be the default set of DS17 data, i.e., the set with the form subpart identifier (ID17) and the OHMIS service area identifier (ID10) but no allowable limits application identifier (ID20) for DS16 data on it. If the less than 200 pounds limit applied only to females, then there would be a set of DS15 data specifying that 'sex' was a factor determining the applicability of the limit and a set of DS16 data specifying that the gender was 'female', i.e., specifying a value for the applicability factors; the DS17 data specifying 'less than 200 pounds' would have the allowable limits application identifier (ID20) for the DS16 data with the applicability value of 'female' entered onto the DS17 data. If data was entered for a 'male', the program would then find no DS16 data corresponding to this applicability characteristic and would thus "conclude" that there were no allowable limits for this data entry; it would not use a default set of DS17 data because there would be no default DS17 data for weight limits because allowable limits applicability factors and values data (DS15 and DS16 data) were provided. If there was also a weight limit of less than

## DATA SET 15

300 pounds for 'males', there would be a second set of DS16 data specifying another allowable limit applicability value (males) and another set of DS17 data with the allowable limit application identifier (ID20) for the second set of DS16 data on it and with the allowable limits specification of 'less than 300 pounds'. Finally, if there were no limits on weight at all, there would be no DS15, DS16, or DS17 data. The default DS17 data is thus only used when there is no allowable limits applicability data (DS15 and DS16 data) for the forms subpart identifier (ID17) and OHMIS service area (ID10).

As with other DS17 data there can be a series of default data, i.e., more than one set of DS17 data for a given forms subpart and OHMIS service area. This would be the case if the default DS17 data had multiple values and these were specified as 'logical ors' or there were different requirements depending on the degree to which the value entered on the OHMIS form was outside the allowable limit (e.g., a different requirement if the employee was between 200 pounds and 250 pounds, than if he was between 251 and 300 pounds). There could also be multiple sets of DS17 default data if there were different allowable limits specified for each of the up to 6 data elements that made up the forms subpart to which allowable limits specification refers.

As indicated above DS15 data describes the applicability factors for either a forms subpart (DS11 data as identified by a forms subpart identifier (ID17)) or an entire form (DS10 data as identified by a forms specification identifier (ID16)). For forms subpart data, each set of DS15 data provides up to five applicability factors for the up to 6 forms units for the forms subpart covered by the set of DS15 data. Forms units are the identifiers which the data elements in the forms subpart describe. For example, if the data being entered on the OHMIS form (i.e., the data in the forms subpart being covered by this set of DS15 data) was an employee's weight and if the age of the employee determined the applicability of the allowable limit for this data element, the type of forms unit described by the forms subpart and therefore the type of forms units which the applicability characteristic (age) describes would be an employee. For allowable limits applicability factors data (DS15) covering allowable limits that apply to the entry of an entire class of data (i.e., the allowable limits for a form as a whole), the DS15 data identifies the up to five applicability factors for each of the up to 9 forms units for the forms specification data (DS10) covered in this set of DS15 data.

1. Forms subpart identifier (ID17) for the group of data elements for which this set of DS15 data describes allowable limit applicability factors. This is left blank if this set of DS15 data describes allowable limit applicability factors for a form-as-a-whole.
2. Forms specification identifier (ID16) for the specification of the form for which this set of DS15 data describes an allowable limit applicability factor (for DS15 data that is for a form-as-a-whole).

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3. The OHMIS service identifier (ID10) for the service area specifying this data.
4. Up to five data element type codes (CT4) or identifier type codes (CT10) defining the factors that determine the applicability of an allowable limit for each of the up to 6 forms units identified on the forms subpart data (DS10) (or the up to nine forms units on the forms specification data (DS10) for DS15 data applying to forms-as-a-whole). The DS11 data covered by this set of DS15 data is identified by the ID17 above while the DS10 data is identified by the ID16 given above. Some forms units may have no applicability factors. Many form subparts will have less than six (often only one) forms unit.

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### Allowable Limits Applicability Values Data

This describes a given set of ranges of values that determine the applicability of a particular set (or a particular series of sets) of allowable limits specifications data (DS17) for the data elements on a particular forms subpart set (DS11) or a particular forms specification (DS10) for a given OHMIS service area (ID10). If, for example, a particular set of allowable limits for a value entered on a physical exam is to be used only when the employee is under fifty years old, the value 'less than fifty' would be given in the DS16 data and the allowable limits application identifier (ID20) on this set of DS16 data would be entered on the DS17 data that is to be used if the prescribed allowable limits applicability values are met (i.e., in this example if the physical exam is being given to a person under fifty years of age). The DS16 data may also be used to describe the applicability of allowable limits used to describe an entire class of data (i.e., allowable limits for forms-as-a-whole) as identified by a forms specification identifier (ID16). This use of the DS15 and DS16 data sets is described in the forms specification data (DS10) description.

The values data given in the DS16 data corresponds to the forms unit types specified in the forms subpart data (DS11) (or forms specification data (DS10) for applicability data for a form-as-a-whole); and, to the allowable limits applicability factors data element types specified in the allowable limits applicability factors data (DS15) for the forms subpart identifier (ID17) (or forms specification identifier (ID16)) and OHMIS service area (ID10) being covered by the particular set of DS16 data. In the sense the DS16 data relates to the DS15 data as the forms applicability values data (DS13) relates to the forms applicability factors data (DS12). However, because there are significant differences between the allowable limits specification data (DS17) for which the DS16 describes applicability and the forms specification data (DS10) for which the DS13 data describes applicability, there are also some differences between the way that the DS16 data relates to the DS17 data and the way that the DS13 relates to the DS10 data.

The allowable limits specification data (DS17) is actually used to show ranges of values that constitute either allowable limits or unallowable limits. For each set of ranges of values given on a single set of DS17 data there is a corresponding set of requirements description data (DS1). If the values being entered on a OHMIS form (DS14 data) match the prescribed range of allowable (or unallowable) limits given on the DS17 data, this triggers the generation of requirements implementation data (DS5) for the requirement corresponding to the DS17 data. The user may wish to trigger different requirements, when the value is outside the allowable limit (i.e., when it matches a given set of unallowable limits) or inside the allowable limit or the user may wish to have requirements triggered when a value is either outside an allowable limit or inside an allowable limit. Similarly, the degree to which the value entered on the OHMIS form is outside (or

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inside) the allowable limit may determine which requirement is to be triggered. Thus, unlike the forms specification data (DS10) for a given forms applicability values data (DS13), there may be multiple sets of allowable limits specification data (DS17) for a given set of allowable limits applicability values data (DS16). These multiple sets of DS17 data which are all found to be applicable because of a match to a given single set of DS16 data (i.e., which all contain the same allowable limit application identifier (ID20)) are referred to as an allowable limit series (as distinguished from an allowable limit set which identifies only one set of DS17 data).

The number of prescribed allowable limits (or unallowable limits) that can be given on a single set of DS17 data depends on four things:

- 1) The allowable limits (or unallowable limit) must be only for one forms subpart identifier (ID17) (or forms specification identifier (ID16) for forms-as-a-whole allowable limits), OHMIS service area (ID10) and one application of the limit (i.e., one set of DS16 data).
- 2) All of the allowable (or unallowable) limits on a single set of DS17 data must relate as 'logical ands', not as 'logical ors'. For example, if the allowable limit is that 'A is less than X and B is less than Y' (where A and B are values for data element types that are both on the same forms subpart), then both of these allowable limits must be shown on the same set of DS17 data, because they are 'logical ands' and both allowable limits must be met for the requirement specified in the allowable limits specification data to be triggered. If, on the other hand, the allowable limit is that 'A is less than X or B is less than Y', then these two allowable limits must be shown on separate DS17 data in order for the program to treat the two limits as 'logical ors', i.e., to trigger the requirement specified in the DS17 data if the data entered on an OHMIS form is found to match either allowable limit. It is important to note that in this case both of these two sets of DS17 data could refer to the same set of DS16 data through the allowable limits application identifier (ID20)), if both limits are to be used provided the values for the applicability factors for these limits match those on the DS16 data. Also the two sets of DS17 data in this series would refer to the same requirement (i.e., contain the same requirement identifier (ID6)) because should the value entered on the OHMIS form match either of these allowable limits the same requirement is to be triggered.
- 3) All of the allowable (unallowable) limits on a single set of DS17 data must trigger the same requirement, when the values being entered on the OHMIS form are found to match the allowable limits given on the DS17 data. This is because the DS17 data can trigger only one requirement. For example, if

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the user wishes to specify that the entry of a value for a data element type on an OHMIS form that is twice the base line value for that data element type is to trigger a different requirement than the entry of a value between base line and fifty percent above base line for the same data element type, then these two unallowable limits would be put on different sets of DS17 data. Again, both of these two sets of DS17 data could refer to the same set of DS16 data, if they were applicable under the same circumstances, and therefore these two sets of DS17 data would be included in the same DS17 data series (i.e., contain the same allowable limit application identifier (ID20)).

- 4) The number of allowable (unallowable) limits on a given set of DS17 data must fit the field size of this data set. This field size is explained below and in the description given of the DS17 data.

Thus there may be more than one set of DS17 data for a given set of DS16 data. There may also, rarely, be more than one set of DS16 data for a given set (or series of sets) of DS17 data. If, for example, a given set of DS17 data is to be used if 'A or B is true', then there would be two sets of DS16 data (one specifying the applicability value 'A' and one specifying the applicability value 'B') each with a different allowable limits application identifier (ID20); there would then be two sets (or two series of sets) of exactly the same DS17 data, one for each set of DS16 data, i.e., one with each allowable limit application identifier (ID20). (If the set of allowable limits were to be found applicable if 'A and B were true', these two applicability values would be shown on the same set of DS16 data.)

Because it is only rarely that there will be more than one set of DS16 data for a given set of DS17 data, but the reverse will frequently be true, the allowable limits specification data (DS17) and applicability values data (DS16) are linked by placing the allowable limits application identifier (ID20) for the DS16 data on the DS17 data, not the allowable limits (ID5; referred to generically as the requirement application identifier because it is used for DS3 and DS4 data as well as DS17 data) from the DS17 data on the DS16 data as is done for the relationship between DS10 and DS13 data. This means that in order to have two different sets of DS16 data linked to the same set of DS17 data, the DS17 data must be repeated with a different allowable limits specification identifier (ID5) for each of the DS16 data on each new set of DS17 data.

Of course, there will in most cases, also be more than one set of DS16 data for a given forms subpart (ID17) (or forms specification (ID16)) and OHMIS service area (ID10) each giving the different circumstances in which the same or different allowable limits apply for the forms subpart or forms specification. Although it is acceptable for two different sets of DS16 data to be referred to the same specifications for allowable limits given in two sets of DS17 data and there are to be two

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different DS17 data sets for the same DS16 data, it is important that the different sets of DS16 data for the same forms subpart (or forms specification) and OHMIS service area not overlap or duplicate each other. For example, if one set of DS16 data specified that the values determining which allowable limits to use were 'greater than fifty' and another set of DS16 data for the same forms subpart (i.e., the same data elements) and OHMIS service area specified the value 'greater than forty', then the applicability characteristics of the unit for which data was being entered onto an OHMIS form could match more than one set of allowable limits applicability values data (DS16 data) i.e., be both greater than fifty and greater than forty and this would be unacceptable. The DS16 data entry program (Menu Selection 4.3.1) will check for this type of consistency.

It is, however, acceptable for the same set of DS16 data to specify the applicability of overlapping or conflicting allowable limits. For example, if one set of allowable limits specification data (DS17) indicates that for all 'females' (the DS16 applicability value) the allowable (unallowable) limit was 'greater than fifty', while another set of DS17 data for the same application (i.e., for the same DS16 applicability value for 'females') indicated that the limit was 'greater than forty', the allowable limits would overlap. While this may be unnecessarily redundant, it would not be unacceptable. This is because the program (contained in Function F3B) that checks for whether the values entered from an OHMIS form match the allowable limits (or unallowable limits) specified on the DS17 data, continues to check for matches even after a match is found in order that matches for all of the up to six data element types in the forms subpart covered by a single set of DS17 data may be identified. Therefore, the program will find all of the matches to the overlapping allowable limits values and trigger the corresponding requirement.

Multiple sets of DS17 data in the same series (i.e., with the same allowable limits application identifier (ID20)) that are inconsistent (e.g., an allowable limit 'equal to 300' and an allowable limit 'not equal to 300') may be specified, because they would be treated as 'logical ors' and there may be different requirements triggered by these two values. However, within a single set of DS17 data, such inconsistency would be treated as a 'logical and', meaning that there would be no possibility of a match (i.e., no entry could ever be 'equal to 300' and 'not equal to 300'). This would not lead to errors when the program is executed, because, unlike the forms specification data (DS10) program which would use the default forms specification if no match to the forms applicability values data (DS13) were found, it is not necessary to find a matching allowable limits specification (DS17) for each entry on an OHMIS form. However, such DS17 data would be useless and therefore the DS17 data entry program (Menu Selection Sequence 4.1.1) will check for this inconsistency.

The user enters the DS16 data using Menu Selection Sequence 4.3.1. Historical DS16 data is maintained. The DS16 data may not be changed; if there is a change in the applicability values for an allowable limit,

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the old DS16 data must be deactivated (Menu Selection Sequence 4.3.2) and new DS16 data added. At the same time the set or series of sets of allowable limits specification data (DS17) with the allowable limits application identifier (ID20) for the set of DS16 data that has been deactivated must also be deactivated and, if appropriate, new DS17 data with the same values added with the new ID20 on it.

1. Allowable limits application identifier (ID20). Unique value assigned by the program to distinguish this set of DS16 data.
2. Forms subpart identifier (ID17) for which this set of DS16 data is specifying the values that will be used to determine which allowable limits are applicable. This field may be blank if this DS16 data specifies the applicability values for a form-as-a-whole.
3. Forms specification identifier (ID16) for the specification of the form for which this DS16 data specifies applicability values (if this DS16 data is for a form-as-a-whole).
4. OHMIS service area identifier (ID10) for the service area specifying these applicability values. The combination of the ID17 (or ID16) and ID10 given above will determine which set of forms subpart data (DS11) (or which set of forms specification data (DS10)) and which set of allowable limits applicability factors data (DS15) should be used to determine the identifier types (CT10) and data element types (CT4) for which this DS16 data is supplying the set of applicability values.
5. The OHMIS user identifier (ID13) for the person promulgating this application of an allowable limit.
6. The employee identifier (ID4) for the above person.
7. Date this DS16 data was generated.
8. End date (deactivation date) for this set of DS16 data. This is the date that this DS16 data is no longer active, i.e., no longer to be used on allowable limits specification data (DS17) to identify the allowable limits for which this set of DS16 data determines applicability.
9. The range of values (or identifiers), if any, that will be used to determine the applicability of the allowable limits for each of the up to six forms unit types given in the DS11 data corresponding to the forms subpart identifier (ID17) given above (or for the up to nine forms units on the forms specification data (DS10) corresponding to the forms specification identifier (ID16) given above, if this DS16 data is for a form-as-a-whole). (See the description given



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in the information triggered requirements applicability data (DS3) for how ranges of values are specified.)

10. The range of values (or identifiers), if any, that will be used to determine the applicable allowable limits for each of the up to five data element types given in the DS15 data corresponding to the forms subpart identifier (ID17) (or forms specification identifier (ID16)) and OHMIS service area identifier (ID10) given above, i.e., the data element types that define the applicability factors (types of characteristics) for each of the up to six forms units (or up to nine forms units). There can be as many as five applicability factors for each of the up to six forms units (or up to nine forms units for forms-as-a-whole applicability values), depending on the definition of applicability factors given in the DS15 data.
11. Description of the conditions that must have existed for the above allowable limits applicability characteristics to have been met and the particular set or series of sets of allowable limits specifications data (DS17) linked to this set of DS16 to have been used. This description is used on output such as the Requirements Notification and Certification Record (03) to tell the user why this set of allowable limits was used in the allowable limits evaluation (Function F38), i.e., why this set of allowable limits was determined to be the applicable allowable limit. This description could include a description of those allowable limit applicability variables (i.e., forms units and applicability characteristics of forms units) the values for which are to be included in the description of why the requirement was triggered given on the output. This description is to be distinguished from the explanation of why the requirement was triggered given on the allowable limits specification data (DS17). That description explains (i.e., instructs the user how to use the information on the output to explain) why the allowable limits were met (and therefore a requirement was triggered); this DS16 explanation explains why a particular set of allowable limits was used to evaluate whether any allowable limits were met, i.e., why a particular set of allowable limits was determined to be the applicable allowable limit.

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### Allowable Limits Specification Data

This data describes one set of allowable limits (or unallowable limits) information for a set of data elements in a given forms subpart data set (DS11) (or forms specification data set (DS10)) and OHMIS service area (ID10) and for a given set of allowable limits applicability values data (DS16) as identified by an allowable limits application identifier (ID20). This set of "givens" is referred to hereafter as a "given application" of an allowable limit.

The DS17 data specifies the requirement identifier (ID6) for the requirement that is to be triggered (i.e., the requirement for which requirements implementation data (DS5) is to be generated, should the values entered on the OHMIS form match the allowable (or unallowable) limit given on the DS17 data. Specifically this data is used to generate the requirements implementation data (DS5) that triggers a requirement. This is done when a value for a data element type that has been entered on a OHMIS form (i.e., entered on completed forms data (DS14)) is found to match the allowable limit (or unallowable limit) given on a set of allowable limits specification data (DS17) for that data element type. Requirements data is also triggered when a user enters data for a certain type of form (CT9) for which there are allowable limits (DS17 data) and for which the entry of data from that type of form as opposed to entry of data of a given data element type) constitutes matching an allowable limit. This type of allowable limit is called an allowable limit for a form-as-a-whole or an allowable limit for a class of data as opposed to an allowable limit for a data element type or form subpart. An example would be an allowable limit for the number of Hazardous Substance Incident Reports (FT1) that can be entered from a given organizational unit before a requirement (e.g., a requirement to determine why the number of hazardous substance incidents is so great) is triggered.

The DS17 data is equivalent to the (information triggered) requirements applicability data (DS3) that describes information triggered requirements and to the requirements suspense data (DS4) that describes date triggered requirements, except that in the case of the DS17 data it is a match to an allowable limit that triggers the requirement. The requirements triggered by DS17 data are referred to as allowable limits triggered requirements. This consistency with the DS3 and DS4 data is why the DS17 data is considered to be one of the three types of requirements applicability data and why each set of DS17 data (like each set of DS3 and DS4 data) is assigned a requirements application identifier (ID5) to distinguish a unique set of DS17 data.

DS17 data is entered by the user using Menu Selection Sequence 4.1.1. Historical DS17 data is maintained. DS17 data cannot be deleted or changed (except for the narrative portions). If the allowable limit does change, the old DS17 data is deactivated (using Menu Selection Sequence 4.1.2) and new DS17 data is added.

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There may be more than one set of allowable limits specifications data for a given application, i.e., with a given allowable limits application identifier (ID20). This would be the case if the user wishes there to be requirements triggered by both allowable limits and by an unallowable limit for a given data element type and the requirements triggered in these two instances are to be different. There may also be different sets of DS17 data for the same given application if the user wishes the degree to which the values for the data entered on an OHMIS form are outside (or inside) the allowable limits to affect what allowable limits requirements are to be triggered. The multiple sets of DS17 data for the same application (ID20) are referred to as a series of sets of DS17 data or an allowable limits specification series.

Each set of forms subpart data (DS11) on a form (ID18) or each form type (CT9) may have:

- 1) no DS17 data, if there are now allowable limits for the forms subpart or form type; or,
- 2) multiple sets or multiple series of sets of DS17 data, if different allowable limits apply depending on the applicability values for the data entered (e.g., one set of allowable limits for females and another set of allowable limits for males); or,
- 3) only one set or one series of sets of DS17 data that does not link to any particular allowable limits applicability data (i.e., has no ID20 on the DS17 data and therefore does not refer to any DS16 data). This last kind of DS17 data is called the 'default' allowable limit for the form subpart (or form-as-a-whole)/service area and is used when there are no factors that determine the applicability of an allowable limit, i.e., no DS15 or DS16 data for the forms subpart (or form-as-a-whole) and service area. If there are allowable limits applicability factors and values (DS15 and DS16 data), but none of the prescribed applicability values match those values for the data being entered, then the default DS17 data is not used. Instead, this finding indicates that there is no allowable limit applicable for the data being entered. (If there are no allowable limits at all, there would be no DS17 data, of any kind, including a default DS17 data.)

For each set of DS17 data there must be one set of requirements description data (DS1) for the requirement that is to be triggered if the values entered on an OHMIS form (or the frequency of the entry of the form-as-a-whole) are found to match the allowable (or unallowable) limits given on the DS17 data. This set of DS1 data is identified by placing the requirement identifier (ID6) distinguishing the DS1 data on the DS17 data. If there is more than one requirement for a given set of allowable limits (or unallowable limits) data, a separate set of DS17 data with the same values, but a different ID6 on it, must be generated.

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The ID6 specifies the requirement which is to be triggered (i.e., the requirement for which requirements implementation data (DS5) will be generated), when the value entered on an OHMIS form (or the frequency of the entry of a form-as-a-whole) matches the allowable limits or (unallowable limits) given on the DS17 data.

The user may wish to specify that a different requirement be triggered for different degrees of being outside the allowable limit. For example, the user may wish that a different action (requirement) be taken, if the value is twice the allowable limit than he/she would have if the value were only fifty percent over the allowable limit. If the user wishes different requirement to be triggered for different allowable (unallowable) limit values, this must be given by specifying multiple sets of DS17 data and linking the requirements description data (DS1) to the DS17 data through a different requirement identifier (ID6) on each set of DS17 data. If there is multiple DS17 data of this type (i.e., all of which have the same application such as, in the above example, having both of the two allowable limits apply only to 'females'), this is shown by giving the same allowable limits application identifier (ID20) on each set of DS17 data.

In addition to being multiple sets of DS17 data because different requirements are to be triggered, there may be multiple DS17 data because there is more than one allowable limit and these multiple limits are not continuous and cannot therefore be expressed in a single range of values. An example would be an allowable limit of '10' or '40'.

Finally, in addition to triggering one or more requirements because a value is outside an allowable limit, the user may wish to specify certain requirements associated with being within an allowable limit. For example, the user may wish medical surveillance terminated if the value for a medical finding is within a certain allowable limit. Requirements that are triggered by values that are within an allowable limit are specified by the user in the same way as requirements that are triggered by being outside an allowable limit. Again, the requirements for allowable limits that are within an allowable limit may depend on the degree to which the value entered on the OHMIS form is with the allowable limit, in which case, there would be multiple sets of DS17 data, each specifying a different range of values that are within the allowable limit, thus enabling different sets of requirements to be linked to these different values. In this sense, the entry of any completed forms data (DS14) for which there are allowable limits constitutes a triggering step as defined in the requirements Function, (i.e., F2). That is, the entry of DS14 data triggers a check to determine if there are applicable requirements, except that in this case the applicability of a requirement depends on whether the value entered on the form matches and allowable (unallowable) limit.

It should be emphasized that a set of DS17 data should be added to the OHMIS data base if and only if a requirement is to be triggered whenever the values entered on the OHMIS form match the limits given on the DS17 data. If no action is to be taken when there is a given single range

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of values entered, then no DS17 data should be specified. This is why the DS17 data will frequently specify unallowable (rather than allowable) limits: It is often the case that it is the unallowable limits that trigger an action. (However, a requirement may be triggered by either or both allowable limits and unallowable limits.) Caution must, therefore, be taken in specifying the values for the limits in the DS17 data to ensure that the intended relationship between the limit and the requirement is given. For example, supposing the allowable limits for a particular data element type on a forms subpart were either '10' or '40' and that if either allowable limit were met, no requirement was to be triggered, i.e., there were requirements only if the values entered on the OHMIS form were outside the two allowable limits (not '10' and not '40'). The user would then wish to specify this allowable limit as an unallowable limit, i.e., if the value entered on the OHMIS form was not equal to '10' and not equal to '40', then the requirement should be triggered. Note that the unallowable limit is an 'logical and', while the allowable limit ('10' or '40') was a 'logical or', and therefore the unallowable limit should be entered on a single DS17 data set. If the two unallowable limits were listed on separate DS17 data (i.e., treated as 'logical ors'), the program would necessarily always trigger at least one of the two requirements on the two sets of DS17 data. This is because the value entered on the form could never be both '10' and '40', so that it would match at least one of the unallowable limits specified (i.e., it would either match the 'not equal to 10' or match the 'not equal to 40' or both) and a requirement would thus be triggered in every case. This would not be the relationship between the allowable limit and the requirement that the user intended. This is an example of how allowable and unallowable limits must be specified carefully in order to trigger the desired requirement.

A single set of DS17 data can include up to twelve allowable (or unallowable) limit specifications, covering one or more of the up to six data element types (CT4) that make up the forms subpart data (DS11) covered by the DS17 data (for DS17 data that covers forms subparts, i.e., data element types, as opposed to forms-as-a-whole). All of the data on a single DS17 data set will be treated as 'logical ands', i.e., the values entered for the forms subpart onto the OHMIS form must match all of the up to twelve allowable limits on the DS17 data set for it to be considered a 'match' and the requirement implementation data (DS5) for the requirement triggered by the allowable limit to be generated.

### Allowable Limits Data Elements

To enter one of the up to twelve allowable limits specifications on the DS17 data set the following set of five data elements (referred to as "Allowable Limits Data Elements") must be completed:

- 1) A number from 1 to 6 indicating for which of the up to six data element types for a forms subpart covered by this DS17 allowable limits data is being specified. The DS17 data entry program (Menu Selections Sequence 4.1.1) will check that

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the number entered is consistent with the number of data element types on the forms subpart being covered by this set of DS17 data as determined from the forms subpart data (DS11).

- 2) A range of values for the allowable limit. This range of values may be given in the form of a table (allowable limit table data (DS21)), by giving an allowable limit table identifier (ID25) or the values can be given here as a range using the following format. A range is specified using one of up to ten formats: The allowable limit (or unallowable limit) must have a value that is a) equal to or b) not equal to, the following five subformats:

- i) X
- ii) > X
- iii) < X
- iv) > X and < Y
- v) < X and > Y

In this range of values X or Y may be one of the following six types of values:

- i) Any individual value, e.g. '10'
- ii) The original base line value for the data element type. The base line value is the first value ever entered onto the OHMIS data base of a given data element type for a given forms unit.
- iii) The latest secondary base line value for the data element type. The 'secondary base line' is a value that is not an original base line, but has been designated as a "new" base line. A secondary base line might be used, for example, if an employee is rehired after a long stay away from the Department of the Army. Secondary base lines are identified by the user on the completed forms data (DS14).
- iv) Number from 1 to 6 of the up to five other data element types in the forms sub part being covered by this set of DS17 data.
- v) The original base line for one of the up to five data element types in this form subpart.
- vi) The secondary base line for one of the up to five data element types in this form subpart.

Some examples of how these formats can be used to specify allowable limits or unallowable limits would be that the allowable limit is: Equal to 10; not equal to 10; not equal to between 10 and 40; not equal to the original base line for this data element type; greater than the value for a specified other data element type in this forms subpart; greater than the secondary base line for one of the up to five other data

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element types; less than the base line for this data element type or greater than 14; etc. For the allowable limits values using base line or other data element types, the user simply enters a code meaning base line (original or secondary) and/or a number from 1 to 6 meaning the number of the other data element type on this forms subpart. The program will look for these values and capture them from the OHMIS data base when evaluating allowable limits (in Function F3B). If they are inconsistent, e.g., the allowable limit is '>30 and < base line' and the actual value for the base line is '25', the program will treat the allowable limits evaluation as though it were a manual allowable limits evaluation and require the user to conduct a manual allowable limits evaluation using the allowable limits check function (Function F3C).

- 3) The relationship, if any, of the above range of values to the other values. That is the relationship between the data element type given in Allowable Limits Data Element Part 1 and the other data element types in the forms subpart. This information is specified using the following three subdata elements:

3a) For which of the other values is the relationship being defined?

- i) The original base line value for the data element type.
- ii) The latest secondary value for the data element type.
- iii) Number from 1 to 6 of the up to five data element types in the forms subpart covered by this DS17 data.
- iv) The original base line for one of the up to five other data element types in the forms subpart.
- v) The secondary baseline for one of the up to five other data element types.

3b) Whether the relationship is multiplicative or additive. The format for multiplicative relationships would be that the allowable limit for the value of the data element type specified in Allowable Limits Data Element Part 1 above must be 'X' times ( > or < ) the value of the data element type specified in Allowable Limit Data Element Part 3a above, where 'X' is the range of values entered in Allowable Limit Data Element Part 2 above. An additive relationship would be that the data element specified in Allowable Limit Data Element Part 1 must match what the value of the data element type specified in Allowable Limit Data Element Part 3a would be if 'X' were added to (or subtracted

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from) that data element type, where 'X' is, again, the value entered in Allowable Limit Data Element Part 2.

- 3c) Whether the relationship is greater than or less than (for multiplicative relationships); whether the relationship is added to or subtracted from (for additive relationships).

Examples of allowable limits using the three data element types in this format would be to specify that the data element type specified in Allowable Limit Data Element Part 1 must be: equal to (or not equal to) 10 times greater than or less than the original base line for this data element type; less than 10 times less than the base line for this data element type; one third of the base line for the other data element types specified in Allowable Limit Data Element Part 3a; not equal to 10 more than (added to) or less than (subtracted from) the secondary base line for this data element type; not equal to between 10 and 40 subtracted from (or added to) the value from another data element type; not equal to the original base line for this data element type added to the value of another data element type; greater than (or less than) the product (or sum or remainder) resulting when the value specified for another data element type given in Allowable Limit Data Element Part 2 above is multiplied (divided, added or subtracted) from the data element type given in Allowable Limit Data Element Part 3a above; etc.

- 4) Whether or not the above specified allowable limit is to be:
- i) Cumulative for the time span shown in Allowable Limit Data Element Part 5 below; or
  - ii) true for each data entry made during the time span shown in Allowable Limit Data Element Part 5 below.
- 5) The time span shown for the allowable limit. This information consists of the following two data elements:
- 5a) A range of values for the time span. As time can only be a positive number this range of values must be equal to or greater than 1.
  - 5b) Whether the time span specified in Allowable Limit Data Element Part 5a above is for:
    - i) The number of data entries of the data element type specified in Allowable Limit Data Element Part 1 above for the value of the forms units specified on the completed forms data (DS14 data) there are applicable to this data element type.



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- ii) A given unit of time and if so what unit. Units of time can be days, months, years, etc; they could also be seconds, minutes, hours, etc, if the time (as well as the date) that the value for the data element type specified in Allowable Limit Data Element Part 1 above was obtained is entered on the completed forms data (DS14).
- iii) A time period, e.g., a week, month, quarter, etc. and if so the time period identifier (ID24) identifying the time period specification data (DS20) for which the time span values given in Allowable Limit Data Element Part 5a above apply.

This time span information given in Allowable Limit Data Element Part 5 enables the user to specify the following two types of allowable limits:

- o Cumulative (answer of 'i') in Allowable Limit Data Element Part 4 above: To be considered a match with the allowable limit, the sum of all of the values of the data entries for a given form unit(s) made during the time span shown by the values given in Allowable Limits Data Element Part 5 above must be equal to the allowable limit given in Allowable Limit Data Element Part 2 or Allowable Limit Data Element Part 3 above.
- o Noncumulative (answer of 'ii') in Allowable Limit Data Element Part 4 above: To be considered to be a match with the allowable limit, each of the values of the data entry made over the time span shown by the values entered in Allowable Limit Data Element Part 5 above for the data element type specified in Allowable Limit Data Element Part 1 above for a given form unit(s), must be equal to the allowable limit given in Allowable Limit Data Element Part 2 or Allowable Limit Data Element Part 3 above.

In these two types of formats for providing time span information the allowable limit time span can be defined in three ways:

- o The amount of time it has taken to make 'X' number of entries (answer of 5, b, i)
- o 'X' amount of time units (i.e., days, months, years, etc. (answer 5, b, ii)); or
- o 'X' amount of time period (answer 5, b, iii).

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Where 'X' in all three cases is the value entered in Allowable Limit Data Element Part 5a. Time units are distinguished from time periods in the following way:

- o Time units end on the date that the value for the data element type was obtained as shown from the completed forms data (DS14), i.e., the date used when making the evaluation of allowable limits. Time units begin on the date equal to the end date minus the time span shown by the value in Allowable Limit Data Element Part 5a.
- o Time periods end on the same date as time units, but begin on a specified date.

For example, a time span of 90 days (90 time units where the unit is 'days') would begin 90 days before the value for the data element was obtained. A time span of one quarter (1 time period where the period is 'quarter'), would begin on the last date that the quarter during which the value for the data element was obtained began, e.g., March 1, which might be considerably less than 90 days prior to the date that the data was obtained. Being able to specify either a time unit or a time period enables the time span for allowable limits to be given as either having a match during the last unit of time equal to a quarter (90 days) or as having a match since the beginning of the current time period equal to a quarter. If the user wishes to state that the allowable limit criteria is that value 'X' cannot have been entered more than once during the last 90 days, he would use time units to specify a time span; if the user wishes to specify that the allowable limit criteria is that value 'X' cannot have been entered more than once since the beginning of the current quarter, he would use time periods. The beginning dates for the time periods are defined in the time period specification data (DS20).

Examples of these types of time span specifications about allowable limits would include specifying:

- o An example of a cumulative time span specification (i.e., an answer of 'i') in Allowable Limit Data Element Part 4: To be considered to match the allowable limit the sum of a given employees millirems of radiation exposure over a time period of one calendar quarter (i.e., since the beginning of the current calendar quarter) must be less than 18,750 millirems. In this example:
  - Millirems of radiation of exposure is the data element type entered onto the OHMIS form for

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which this set of DS17 data is providing allowable limits specifications, i.e., the Allowable Limit Data Element Part 1;

- The time span specified was one calendar quarter. This was specified by answering Allowable Limit Data Element Part 5a with the value '1' and Allowable Limit Data Element Part 5b with the value 'iii)' (time period) and the time period specification identifier (ID24) for a calendar quarter;
  - The value 18,750 is the allowable limit specified in Allowable Limit Data Element Part 2.
- o An example of a noncumulative (i.e., answer of 'ii)') in Allowable Limit Data Element Part 4: To be considered to match the allowable limit, each of the radiation exposure entries made for a given employee for the last two entries (for two entries in a row) must be greater than 1,000 millirems. In this example:
- The user specified the time span as follows:
    - + The value of Allowable Limit Data Element Part 5a was given as '2' and
    - + The value given for Allowable Limit Data Element Part 5b was 'i)' (number of data entries);
  - '1000' is the unallowable limit specified in Allowable Limit Data Element Part 2.
- o Another cumulative example: To be considered a match to the allowable limit, the sum of the radiation exposure entries made for a given employee over the last 90 days must be greater than 1000 millirems. In this example the user specified the time span as follows:
- The value for Allowable Limit Data Element Part 5a was given as '90'; and,
  - the value for Allowable Limit Data Element Part 5b was specified as 'ii)' (time unit) with the unit specified as 'days'.
- o Another noncumulative example: To be considered a match to the allowable limit, the value for each

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entry of millirems entered on an employee must be greater than 1,000 millirems. In this example there is no time span; the allowable limit (1,000 millirems) is given in Allowable Limit Data Element Part 2 and applies regardless of the results of the previous entries of millirems values for the same employee (i.e., previous entries of the same data element type for the same forms unit). In this example Allowable Limit Data Element Part 5a would be answered as '1'; and, Allowable Limit Data Element Part 5b would be answered as 'i)' (number of data entries).

It should be noted that the time span information part of the allowable limits specifications makes it important to keep track of the sequence in which a given data element type for a given forms unit is entered. For example, if an allowable limit specification is of the format "the test result A must have been greater than X for the last 10 times that this test result was entered for this employee", then it is important that the program be able to quickly identify the sequence in which the test result A values were entered for an employee. This is made more difficult by the fact that the form used to enter a certain type of test result (or other data element type) may change over time and the fact that in some cases not all of the data on a form will be completed. These two facts mean that it is not possible to identify the sequence of an entry of a data element type for a given forms unit simply by counting the number of forms entered for a forms unit of the form type on which the data element type is entered. Instead, each value entered for a given data element type must be given a Data Element Sequence Number. This sequence number is identified for a value of a data element type by the OHMIS program (not the user) by using the current forms list (DL23) to identify the last set of completed forms data (DS14) for the same type of form (CT9) that has a completed entry for the data element type. This Data Element Sequence Number is entered onto the DS14 data at the time that the values from an OHMIS form are entered onto the OHMIS data base (Function F3B).

As can be seen from the above examples, a very wide range of types of allowable limits can be specified using the DS17 data. Another example must be given however to indicate how the user may specify table-type allowable limits. Often allowable limits are of the type "if the value for A is X, then the value for B must be Y". For example, an allowable limit such as the airflow required for a hood (value for 'A') often depends on the amount of the hazardous substance (value for 'B') being used within the hood. This type of allowable limit is basically similar to a 'logical and' type of allowable limit and could be shown in the same way as the allowable limits in the other examples given above, by

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generating multiple sets of DS17 data each with a pair (in this case) of allowable limits (one for 'A' and one for 'B') on a single DS17 data set. However, this would be cumbersome as there may be a very long number of pairs (or more in other examples of this type of allowable limits specification) of values needed, i.e., a very large table.

To avoid this, another allowable limit format can be used. In this format, the user would complete one set of DS17 data specifying the relationship between the up to six data element types in the forms subpart covered by the DS17 data. However, no values for the allowable limit, i.e., no Allowable Limit Data Element Part 2 of the above five allowable limit data elements, would be given in the DS17 data. Instead the user would enter an allowable limit table identifier (ID25) on the DS17 data identifying the series of allowable limit tables data sets (DS21), i.e., the allowable limits table containing the allowable limits table list (DL19). Each DS21 data set provides one of the combinations of the values for the up to six data element types on a forms subpart that are to constitute a match to an allowable (or unallowable) limit and thus trigger the requirement specified in the DS17 data. The DL19 lists all of the DS21 data for a given ID25, i.e., all DS21 data sets in the same table.

The allowable limits specification data (DS17) is also used for an allowable limit covering an entire class of data, i.e., the entry of data for a 'form-as-a-whole'. (This type of allowable limit is described in the form specification data (DS10)). Basically, this type of allowable limit would specify the number of entries of data for a certain type of form (rather than for a certain data element type) for a given forms unit needed to be considered a match to an allowable limit. An example of such an allowable limit would be "if X Hazardous Substance Incident Reports (FT1) were entered for a given facility within a given month" the allowable limit would have been met and a requirement would be triggered. In this example, 'X' is the allowable limit, the 'facility' is the forms unit and the 'month' is the time spanned.

The major difference between allowable limits for data element types (which are covered by forms subparts) and allowable limits for forms-as-a-whole are that the DS17 data applies to a forms specification identifier (ID16) rather than a forms subpart identifier (ID17). Also the number of data element types that can be forms units is 9, rather than 6 (it is very unlikely that nine will ever be used, but the identification of the data element types that constitutes the forms units is based on the order in which the forms-as-a-whole forms units are listed as identified in the DS10 data; as there can be 9 such forms units on a given form, the number needed to cover all of the different forms subparts that may be on a form), the value(s) identifying the forms unit(s) for the form-as-a-whole can be from 1 to 9. Another difference between data element type and form-as-a-whole types of allowable limits is that there can be no 'logical ands' in the allowable limits specification for forms-as-a-whole; that is; only one of the up to 12 sets of Allowable Limit Data Element sets can be completed on a given set of DS17 data for this type of allowable limits specification.

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Specific other differences in completing the 5 Allowable Limit Data Element Parts for the form-as-a-whole type of allowable limit are:

- o The value for the data element type identified as Allowable Limit Data Element Part 1 is left blank.
- o The allowable limit given (i.e., the value given in Allowable Limit Data Element Part 2 must always be a positive number). Also, it cannot be an allowable limit table identifier (ID25), another data element type, a base line, etc.
- o There would be no relationship to other data element types or base line data, i.e., the Allowable Limit Data Element Part 3 would be left blank.
- o The answer to Allowable Limit Data Element Part 4 would always be 'cumulative'. (Note: If entry of data for this type of form-as-a-whole only once constitutes the allowable limit trigger, the value for Allowable Limit Data Element Part 4 would still be 'cumulative', but the value for Allowable Limit Data Element Part 5a would be '1').
- o The answer to Allowable Limit Data Element Part 5b must be either 'ii)' (time unit) or 'iii)' (time period); the answer of 'i)' (number of data entries) would not make sense.

An example of this type of allowable limit would be: "If two or more Hazardous Substance Incident Reports (FTI) is entered for a given facility during the last month" then the allowable limit has been met and a requirement should be triggered (where the Hazardous Substance Incident Report is a form used for recording spills and other events/accidents involving hazardous substances). In this example, Allowable Limit Data Element Part 2 would be 'greater than 1'; the value for Allowable Limit Data Element Part 5a would be '30'; and the value for Allowable Limit Data Element Part 5b would be 'ii)' (time unit) with the time unit specified as 'days'.

To further clarify the difference between time units and time periods with this example we will change this example slightly: If the allowable limit had been "if two or more reports are entered during the current month", rather than during the last month's time (i.e., if the time span were to begin at the beginning of the month rather than 30 days previous to the entry of the form) then Allowable Limit Data Element Part 5a would have been completed as '1' and Allowable Limit Data Element Part 5b would have been completed as 'iii)' (time period) with the time period specified by a time period specification identifier (ID24) that gave the beginning of the time period as a calendar month.

1. (Allowable limits specification) requirement application identifier (ID5). Unique value assigned by the program to distinguish this set of DS17 data.

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2. The form subpart identifier (ID17) for which this set of DS17 data constituted allowable limits. This would be left blank if the DS17 data is for an allowable limit for an entire class of data, i.e., for a form-as-a-whole type of allowable limit, as defined in the DS10 data description.
3. The forms specification identifier (ID16) for which this set of DS17 data constitutes and allowable limit (for forms-as-a-whole allowable limits).
4. OHMIS service area identifier (ID10) for which this set of DS17 data is specified.
5. Allowable limit application identifier (ID20) of the allowable limit applicability values for which this set of DS17 data constitutes one set of applicable allowable limits. Would be left blank if this is the 'default' allowable limit. If entered, the program checks that this identifier is consistent with the ID17 (or ID16) and ID10 provided above. Because there cannot be a default set of allowable limits (DS17) data for a forms subpart/OHMIS service area (or a form-as-a-whole service area), if there are any allowable limits applicability factors and values (DS15 and DS16 data), the DS17 data entry program (Menu Selection Sequence 4.1.1) will require that there be an ID20 given for the form subpart/OHMIS service area (or form-as-a-whole/service area) given above, unless there is no set of DS15 data for that forms subpart/service area or form-as-a-whole/service area. If there is DS15 data, an allowable limit application identifier (ID20) identifying a set of DS16 data corresponding to this DS15 data must be entered on the DS17 data.
6. Date this allowable limits specified.
7. End date (deactivation date) for this allowable limit.
8. The OHMIS user identifier (ID13) for the person specifying this allowable limit.
9. The employee identifier (ID4) for the person promulgating this allowable limit.
10. The OHMIS user identifier (ID13) of the person approving deactivation of this allowable limit.
11. The employee identifier (ID4) of the above person.
12. Which of the forms units to which this forms subpart (or forms specification) applies are to be used to define this allowable limit. The answer may be 'all' (it would be 'all', if there was only one forms unit; or, a subset of the up to 6 forms units for a forms subpart (up to 9 forms units for a forms

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specification) specified in the forms subpart data (DS11) or the forms specification data (DS10). For example, if the forms unit(s) for a Hazardous Substance Incident Report (FT1) were an organizational unit and a facility, this allowable limit may be defined in terms of all entries of this form for either a particular combination of these two forms units or for only one of these two forms units. For example (using a forms-as-a-whole allowable limit specification) FT1 may provide data on both the organizational unit and the facility (and thus both of these items are forms units for this type of form), but the allowable limit of "2 or more Hazardous Substance Incidents Reports in a month" may apply only if the forms are submitted from the same facility (regardless of the organizational unit); or, the allowable limit may specify that the forms must be submitted twice in a month from the same combination of organizational unit and facility for the allowable limit to be met. In the first example, only the facility type of forms unit is to be used in the evaluation of allowable limits; in the second example, both of the two forms units are to be used in the allowable limits evaluation.

13. Which of the forms units are to act as requirements implementation units for any implementation of the requirement (ID6) identified below. The requirement implementation unit(s) is the person or thing about which the form is to be implemented.
14. Narrative description of the allowable limit (supplement to the requirement description). This describes the allowable limit verbally (as distinguished from the formatted description of the allowable limit given in the Allowable Limit Data Element Parts). This description is used if a manual check of allowable limits is needed (see below). This description also includes additional explanation of the requirement triggered by this allowable limit (see requirement identifier (ID6) below) beyond that given in the requirement description data (DS1) that explains this particular application of the requirement.
15. Answer to the question: Must the determination of whether there is a match to an allowable limit be made manually?  
Answer: Yes/No. The OHMIS DS17 data is organized such that the OHMIS program (using Function F3B) will be able to determine whether there is a match to an allowable limits specification. However, to cover those allowable limits that do not fit the many formats provided for specifying allowable limits given in the DS17 data, the user may specify that the evaluation of allowable limits must be done manually. If the answer is 'Yes', each time the program determines that this set of DS17 data is an applicable allowable limit, the program will retain the allowable limits check request data



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(DS18) generated during Function F3B so that the user can use this data to manually evaluate the allowable limits.

### Allowable Limits Data Elements

16. Up to 12 sets of Allowable Limit Data Elements (i.e., the 5 part set of data elements described above in the introduction to this description of the DS17 data).
17. Allowable limits table identifier (ID25), if any, for the list of allowable limits table data (DS21) that is to be used as allowable limit values (i.e., Allowable Limit Data Element Part 2) for this allowable limits specification.

### Requirements Information

18. Requirement identifier (ID6) for the requirement that is to be triggered (i.e., the requirement in which requirements implementation data (DS5) is to be generated) when the values entered on an OHMIS form match the allowable limits given in this set of DS17 data.
19. The identifier for the organizational level type (CT5) at which the determination of whether the requirement applies is to be made. This can (and in most cases will be) the identifier for an OHMIS service area (ID10), an installation (ID11), an organizational unit (ID12), a job class (ID7) or a facility (ID8) depending on the purview of the requirement's applicability. The requirement description data (DS1) for the above referenced requirement identifier (ID6) prescribed at what type of organizational level (CT5) the requirement is to be applied (e.g., by service area, installation, etc.); this DS17 data element provides an actual value for the organizational level at which it applies. The entry program, therefore, checks that the identifier value supplied here is consistent with the type of identifier for an organizational level (CT5) provided in the DS1 data for the requirement.
20. Description of the conditions that triggered this implementation of the requirement. Used in output such as the Requirements Notification and Certification Record (03) to inform the user of why this requirement was implemented. In the case of requirements triggered by allowable limits, this includes the description of those forms units and data element types the values for which triggered the implementation of the requirement. For example, if the requirement was triggered by an employee having a hearing test result that exceeded the allowable limit above the base line hearing test for this employee, the statement might read: "This requirement was triggered by the entry of the below referenced hearing test result for the below referenced employee". This statement would appear on the 03 type of output followed by the values

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for the forms unit (in this case an employee identifier) and the data element type (in this case a hearing test result) identified in this field as narrative data.

21. If this is a default allowable limit (i.e., an allowable limit for which there are no allowable limit applicability factors (DS15 and DS16 data)) then this field would include a statement to that effect.
22. Description of any additional checks that the user should exercise to determine whether the requirement is applicable and should be implemented beyond those specified in the allowable limits data. This would include restrictions on the applicability of the requirement that cannot be specified through allowable limits data.
23. Description of the Menu Selection Sequence, if any, for undertaking the data processing actions for the above referenced additional checks.
24. The OHMIS user identifier (ID13) or OHMIS position identifier (ID14) for the user/position of the person who is to execute this requirement, i.e., the primary person who is to be notified of this requirement. (See DS3 data for further explanation of this field.)
25. Same as above for the management person, if any, who is to be notified of the requirement in order to supervise it's execution. (See DS3 data for further explanation of this field.)
26. Same as above for the person, if any, who must approve the disposition of the requirement. (See DS3 data for further explanation of this field).

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### Allowable Limits Check Request Data

This data is used to temporarily store the values needed for an allowable limits evaluation (Function F3B) until it can determine whether there is a match to an applicable set of allowable limits specification data (DS17); at that point, the DS18 data is either erased (if there is no match) or it is used as a part of the data for generating a set of requirements implementation data (DS5) for one of the requirements that are to be triggered by matching allowable limits and then erased.

The DS18 data is not entered by the user; it is generated by the program as a part of Function F3B. If the allowable limits evaluation program (part of Function F3B in which data is entered from completed OHMIS forms) is able to determine which allowable limits apply and whether the values entered from the completed forms match the prescribed allowable limit values, then the DS18 data is erased. If the current OHMIS data base does not contain the information necessary to determine which allowable limits specifications are applicable (i.e., if it does not contain the values for the allowable limit applicability factors (DS15)) or if the allowable limit is one that must be evaluated manually, the Function F3B program retains the DS18 data. The DS18 data is then used to notify the user that an allowable limits check is needed, using the Allowable Limits Check Notice (09) and the Outstanding Allowable Limits Checks Needed List (010). The DS18 data is deleted at the time that the user conducts this allowable limits check (Function F3C).

1. Allowable limits check request identifier (ID22). Unique value assigned by the program to distinguish this set of DS18 data. Used to execute the allowable limits check (Function F3C).
2. OHMIS service area identifier (ID10) for the service area in which the completed form (DS14) data was generated for the completed form that triggered the allowable limits evaluation generating this set of DS18 data.
3. Date on which this DS18 data was generated.
4. Completed forms identifier (ID18) for the completed forms data (DS14) for the form, the entry of data from which triggered the allowable limits evaluation that generated this set of DS18 data.
5. Completed forms identifier (ID18), if any, for the last completed form (i.e., DS14 data) of the same form type (CT9) and for the same forms unit(s) as the above form, i.e., the completed form that contains the data obtained immediately before the data on the form referenced above. This form is identified from the current forms list (DL23) at the time that the above form is entered (Function F3B) and is entered onto

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both the DS14 and the DS18 data, before the ID18 on the DL23 is replaced by the above "new" ID18.

6. Whether this set of DS18 data is an allowable limits check for a forms subpart (Answer: '1') or for a form-as-a-whole (Answer: '2'). As explained in the allowable limits specification data (DS17) an answer of '2' means that the allowable limits check is to determine whether there are any allowable limits on the entry of the entire class of data covered by a form of a particular specification (ID16), e.g., any allowable limits for the number of hazardous substance spill reports entered for a single facility, as distinguished from a check for allowable limits relevant to an individual data element type entered for a particular forms subpart on a form.
7. Forms specification identifier (ID16) for the version of the form being entered, i.e., the form version on the set of DS14 data referenced by the first ID18 given above.
8. Forms subpart identifier (ID17) for the particular part of the form, if any, covered by the allowable limits evaluation in which this set of DS18 data was generated. If this is an allowable limits evaluation for a form-as-a-whole, this data element will be left blank.
9. The data element types (CT4) and values for the up to 6 forms units (up to 9 for form-as-a-whole allowable limits evaluations) entered onto the form. This data is obtained from the DS14 data corresponding to the first ID18 above. The completed forms data entry program (Function F3B) determines which of the forms unit(s) on the form apply to the forms subpart identifier (ID17) for which this allowable limits evaluation is being conducted (or applied to the form-as-a-whole, if that is the type of allowable limits evaluation being conducted) using the forms specification data (DS10) corresponding to the above ID16.
10. When of the above forms units are to be used to evaluate the allowable limits. The answer given here could be 'all' or could be a series of numbers from 1 to 6 (or from 1 to 9 for forms-as-a-whole) identifying the above forms units. The data comes from the DS17 data corresponding to the below referenced ID5.
11. The data element types (CT4) and values for the up to 5 allowable limits applicability factors for each of the up to 6 (or up to 9) forms units identified above. The Function F3B program uses the allowable limits applicability factors data (DS15) to determine which data element types are the allowable limits applicability factors for this form subpart and OHMIS service area or for this form specification and OHMIS service

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area. The program then searches for the values for these factors in the existing OHMIS data base and, if possible, abstracts them. If it is not possible to obtain from the existing OHMIS data base the values for all of the allowable limits applicability factors, an allowable limits check (Function F3C) request is triggered by retaining the above ID22 (allowable limits check request identifier) on the list of allowable limits check request identifiers by OHMIS service area (DL17).

12. Values entered onto the above identified completed form, i.e., the values from the DS14 for the first ID18 given above for the up to 6 data element types that make up the forms subpart data for the DS11, identified by the forms subpart identifier (ID17) above. In other words, these are the actual values being entered onto the OHMIS data base from this completed form for which an evaluation of allowable limits is being made. This would be left blank if this is an allowable limits evaluation for a form-as-a-whole.
13. The up to 12 (2 for the up to 6 data element types in a form subpart) completed forms identifiers (ID18) for the forms containing the original baseline values and the secondary baseline values used in the allowable limits evaluation covered by this set of DS18 data. These fields are not used for forms-as-a-whole allowable limits evaluation. The secondary baseline used in automatic allowable limits evaluation that takes place when data from an OHMIS form is entered (i.e., Function F3B) is the latest secondary baseline for the above forms unit and for the same data element type as that for which allowable limits are being evaluated. (Secondary baselines are those values other than the original entry for the data element type and forms unit, i.e., other than the original baseline, that the user has determined should be used as a baseline value.) If there is no secondary baseline, the secondary baseline is left blank. For allowable limits checks (Function F3C) that are done by the user (rather than automatically), the user can specify which secondary baseline is to be used.

There can be up to 6 ID18s for original baseline entries and 6 ID18s for secondary baseline entries (for a total of 12), if the baseline values that are automatically used or are chosen have been entered on different forms for each of the up to 6 data element types in a forms subpart.

14. The values for the above 12 baseline entries. Can be up to 12 values, 2 for each of the data element types in the forms subpart (ID17) being covered by this allowable limits evaluation.

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15. The forms containing the baseline entries and the values for the baseline entries are entered on the DS18 data in order to facilitate the manipulation of data needed to evaluate an allowable limit. These are also used in the outputs to tell the user of the circumstances under which an allowable limit was met for those outputs that cover requirements generated by allowable limits. However, many of the allowable limits will not use baseline entries to define the allowable limits. In these cases, there will be no need to identify the baseline entry values to conduct the allowable limits evaluation and, therefore, the fields covering baseline entries on the DS18 data will be left blank.
16. The allowable limits application identifier (ID20) for the set of allowable limits applicability values (DS16) which was found to match the values entered above for forms units and applicability factors. This ID20 indicates which set or series of sets of allowable limits specification data (DS17) are to be used to determine whether the values entered on the form match an allowable limit. This identifier would be left blank if the OHMIS program was not able to abstract the values for all of the allowable limit applicability factors (as identified in DS15 data) for the particular set of forms units entered on this completed form and thus was unable to determine whether a set of allowable limits applicability values (DS16) matched the corresponding values for these forms units. This ID20 field is left blank if this set of DS18 data is for an allowable limit specification.
17. (Allowable limits specification) requirement application identifier (ID5) for the set of allowable limits specification data (DS17) found to be applicable. This would be left blank during the Function F3B if the program is not able to identify the applicable allowable limits. The Function F3B program identifies the applicable allowable limit (ID5) and enters it on the DS18 data. The program then determines whether it is the type of allowable limit for which the program can determine if there is a match to the data entry on the form being entered, i.e., whether it has been possible to enter the entire allowable limits specification in the Allowable Limit Data Element Parts format provided or whether a manual check for allowable limits is needed. If the answer is 'Yes' (no manual check needed), the program proceeds with determining whether there is a match to the allowable limit and then erases the DS18 data. If the answer is 'No' (i.e., a manual check is needed to determine if there is a match with this allowable limit specification), the identifier (ID5) for the allowable limits specification is retained on the DS18 data (i.e., the DS18 data is not erased) in order to enable the DS18 data to be used to inform the user on the Allowable Limits Check Notice (09) of which allowable limits specification is to be checked. In other words, the DS18 data

DATA SET 18

that has an ID5 on it will only be kept (not erased) if it is the type of allowable limits specification that requires a manual check. The only other reason for retaining the DS18 data would be that it was not possible to automatically determine from the current OHMIS data base which of the allowable limits specifications were applicable; in this case, the ID5 would not be completed.

## DATA SET 19

### Missing Data Element Information

This data describes one piece of information that is currently missing from the OHMIS data base. Missing information is defined as information for which a value could not be entered (i.e., the data element type was on a forms specification or was normally part of the data supplied at the time by a given External Data Source (EDS) such as SIDPERS) but was not entered.

DS19 data is generated by the program at the time that the data is supposed to have been entered from an OHMIS form (Menu Selection Sequence 3.1; Function F3B for adding completed forms data (DS14) and Menu Selection Sequence 3.3 for changing completed forms data) or when data is extracted from an External Data Source and found to be missing. The missing data element list (DL25) provides an index to the DS19 data by identifier. This list is used to identify all missing data elements for a given forms unit identifier (e.g., an employee) at the time that an OHMIS blank form is generated for that identifier (Menu Selection Sequence 2.1.5; Function F3A) so that a special 'Missing Data Element Type Form' can be generated to obtain all missing data elements for that identifier (e.g., for the employee for which a blank OHMIS form is being generated). Thus, the OHMIS program provides for routinely obtaining missing information (using a missing data element type form) whenever a form is generated for a identifier that is shown on the DL25 list to have values for data elements missing. For example, whenever an employee is about to come to the OHMIS for a medical exam, the process of generating a blank form on which to conduct that medical exam (i.e., Function F3A) will automatically result in a search to determine if there are any missing data elements for that employee in the OHMIS data base and, if so, the generation of a Missing Data element Type Form to obtain those missing data element types.

Only current DS19 data is maintained. The data is deleted and removed from the DL25 list, at the time that the user supplies the missing information. This can be done during Menu Selection Sequence 3.5 or by entering the data from a Missing Data Element Type Form. Information is considered missing as long as there is no answer provided, i.e., the field is left blank. A value of 'unknown' or 'not applicable' is considered to be an answer and would not therefore be a missing data element.

1. Missing data element information identifier (ID21). Unique value assigned by the program to distinguish this set of DS19 data.
2. Data element type code (CT4) for the data element type that has a missing value.
3. Up to six forms unit identifiers for the identifier or set of identifiers about which the data element type is missing.



## DATA SET 19

For example, if an employee's date of birth is the missing data element type, it is that employee's identifier (ID4) that would be placed in this field. If the information was identified as missing during the entry of completed forms data (DS14) for an OHMIS form, this identifier would be the forms unit identifier(s) for the missing data element type (as defined in the forms specification data (DS10)) for that form and for the forms subpart from which the data element type was missing. There will normally be only 1 identifier, but some data element types describe a relationship between more than one identifier and therefore multiple identifiers may be used to a maximum of the 6 forms unit identifiers allowed for a single forms subpart on the DS10 data. The DL25 provides an index to the missing data element types by this identifier or set of identifiers. This is done in order that all missing data element types for a given identifier (e.g., for a given employee) can readily be identified.

4. Date that the above data element type was found to be missing.
5. Completed form identifier (ID18) of the completed form (DS14), if any, for which this data element type is currently missing. This field would be left blank if the data is not missing from an OHMIS form, e.g., if it is obtained from an External Data Source.
6. The forms subpart identifier (ID17) for the forms subpart on the completed forms data (DS14) identified by the above ID18 from which this data element type is currently missing.
7. The location in which the value for the missing data element type is to be stored once it is obtained. This information is transparent to the user and will depend on the files of storage configuration selected for OHMIS. However, it is anticipated that the location will be defined in terms of the completed forms identifier (ID18) for the form from which the missing data element type is missing, for data element types missing from OHMIS forms and/or in terms of the unit described by the data element. The storage information is on the DS7 data for the data element.
8. The completed form identifier (ID18) for the current outstanding (uncompleted) Missing Data Element Type Form containing a request for this missing data element, if any. When a Missing Data Element Type Form is generated in Function F3A, this field is completed, otherwise it is left blank. When the values for the completed Missing Data Element Type Form are entered (Function F3B), either the entire DS19 data is deleted (because the value for the data element type is no longer missing) or, if the value for this data element type is not entered at that time (i.e., it is still missing) the ID18 for the Missing Data Element Type Form is removed from this DS19 data set.

## DATA SET 20

### Time Period Specification Data

This data is used to define a particular time period. This definition is used in several ways in the OHMIS data base. For example, it is used when specifying the time span information part of the Allowable Limits Data Elements (see allowable limits specification data (DS17)). The same set of DS20 data is used for all OHMIS service areas. DS20 data is entered by the user using Menu Selection Sequence 6.1. DS20 data cannot be changed or deleted.

A series of sets of DS20 data defining the most common (calendar) time periods will be input at the beginning of the OHMIS program and it is expected that there will not be many additional time periods added. However, for some types of time periods the 'begin time' for the time period may need to be varied. For example, although all radiation exposure measurements may be on the same time period unit (quarters), different installations may have different begin dates for the quarter, i.e., the quarter does not necessarily always begin on the first day of each first, forth, seventh and tenth calendar months in a year. As described in the DS17 data, time periods are distinguished from time units in that they have a specified begin date.

1. Time period specification identifier (ID24). Unique value assigned by the program to distinguish this set of DS20 data.
2. Time period unit. Answers include: Minutes, hours, days, weeks, months, quarters, semesters, years, etc. If this is a time period data set defining a time period from a given date to the present, then there would be a code in this field indicating this, e.g., code 'NS' for Nonstandard time period.
3. Begin time. This is specified using one of several different formats depending on the time unit. Examples are:
  - o Minutes: Value from 1 to 60 (indicating the starting second).
  - o Hours: Value from 1 to 60 (indicating the starting minute).
  - o Days: Values from 1 to 24 (indicating the starting hour) and values from 1 to 60 (indicating the starting minute for the hour).
  - o Weeks: Value from 1 to 7 (indicating the start day of the week) and values from 1 to 24 (starting hour) and 1 to 60 (starting minute of the hour).
  - o Etc.

## DATA SET 20

If this is a Nonstandard type of time period, the begin date would be and hour, day, month, and year.

The format for entering the begin time information is to provide the begin time for each of the time units there are smaller than the time units specified above. Thus, if the time unit specified above was 'quarter' the user must indicate begin time (1 through 12) and day of the month (1 through 31); the user would probably set the hour of the day, the minutes of the hour and the seconds of the minutes at '0'.

## DATA SET 21

### Allowable Limits Table Data

This data is used to specify the values for a table that should be used when evaluating allowable limits. The allowable limits specification data (DS17) specifies which table (i.e., which series of DS21 data sets), if any, is to be used as the prescribed allowable limits values, by providing an allowable limits table identifier (ID25).

Allowable limits tables are used for specifying allowable limits when there is a large series of combinations of allowable limits (each combination bearing the same relationship to each other) that apply. For example, if the allowable limit for air flow on a fume hood depends on the amount of the substance used in the fume hood, then this information (i.e., this relationship) could be portrayed as a table showing combinations of air flow values and amounts of hazardous substance values. The relationship between these combinations of data element types is prescribed in the allowable limits specification data (DS17) which specifies this table as the allowable limits table to be used for evaluating allowable limits.

All of the data element types in an allowable limits table must belong to the same forms subpart (DS11). Therefore, the allowable limits table can consist of combinations of up to 6 data element types (the maximum in a forms subpart). One set of allowable limits data (DS21) constitutes a single combination of allowable limits values for these data element types. All combinations of allowable limits for a given allowable limit table identifier (ID25), e.g., all sets of amounts of air flow and amounts of hazardous substance, are listed on an allowable limits table list (DL19). The DL19 lists all active DS21 data for a given ID25.

DS21 data is entered by the user using Menu Selection Sequence 4.5.1 (for adding DS21 data to an existing allowable limits table (DL19)) or Menu Selection Sequence 4.5.2 for starting a new allowable limits table. Historical DS21 data is kept. DS21 data cannot be changed or deleted. If a set of DS21 data is no longer valid, it is deactivated using Menu Selection Sequence 4.5.3. If all DS21 data for a given ID25 are deactivated, then the program will require that all of the DS17 data containing that ID25 also be deactivated. The source information for and identity of the person promulgating the allowable limits table is given in the requirements description data (DS1) referred to by the requirement identifier(s) (ID6) in the DS17 data using the ID25 for this set of DS21 data.

Because the DS17 data referring to the DS21 data also specifies the requirement identifier (ID6) for the requirement that is to be triggered if there is a match to the allowable limits, different series of DS21 data (i.e., different tables of allowable limits) must be generated each time there is a different requirement that is to be triggered. For example, if a different requirement is to be triggered if the air flow is less than twice the allowable limit than it is if it is greater than

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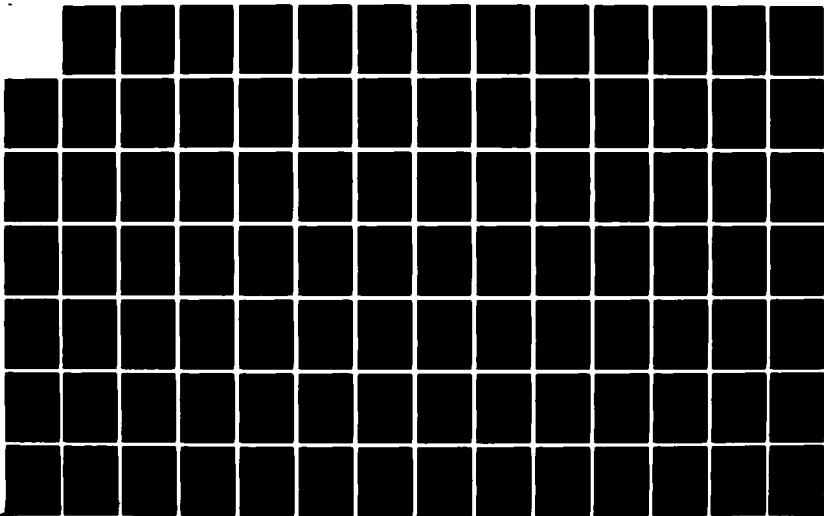
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MANAGEMENT INFORMAT..(U) SAFETY SCIENCES SAN DIEGO CA  
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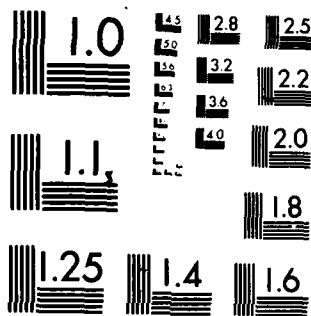
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## DATA SET 21

twice the allowable limit, then two sets of tables and two sets of DS17 data (each referring to different requirements) would need to be generated.

The DS21 data entry program (Menu Selection Sequence 5.4.1) checks that for the same ID25 there are no overlapping or inconsistent allowable limits in the same allowable limits table.

1. Allowable limits table identifier (ID25). If the user is starting a new table (Menu Selection Sequence 4.5.2), this is a unique value assigned by the program to distinguish this series of sets of DS21 data. If the user is adding to an existing table (Menu Selection Sequence 4.5.1), the user specifies the ID25 and the program locates the corresponding DL19 with that ID25 and adds the new DS21 data to that list.
2. One combination of allowable limits values, i.e., I.E., Allowable Limits Data Element Part 2 given in a set of DS17 data, for the up to 6 data element types that make up the forms subpart data (DS11) for which the allowable limits specification data (DS17) referring to this allowable limits table is specifying allowable limits. In the above example, this would be the value of the air flow and the value of the amount of the hazardous substance that constitutes an allowable (or unallowable) limit.
3. Date this DS21 data was generated.
4. Date this DS21 data was deactivated (may be blank).

## DATA SET 22

### Outstanding (Uncompleted) Forms Monitoring Data

This data describes the characteristics of each outstanding OHMIS form, i.e., each form for which a 'blank' form (output 012) has been generated (i.e., in Function F3A) but for which the data has not yet been entered onto the OHMIS data base. The primary purpose of this data is to monitor for forms that are overdue and thereby facilitate the flow of data in OHMIS. This data set also keeps track of the data element types on Missing Data Element Type Forms, i.e., forms generated by the OHMIS program to capture data elements that are missing from the OHMIS data base. The DS22 data can thus also be used to reproduce a copy of a partially blank form that has already been previously generated, i.e., a blank form that has the forms units and other identification on it. The DS22 data is also used when entering data from an OHMIS form (Function F3B) to provide the identification information on the form so that the user does not have to re-enter it. This identification information was entered on the DS14 data corresponding to the form at the time the form was generated.

The DS22 data is used to generate the Outstanding Data Request Lists (013). This output is generated daily by the OHMIS program (Function F1A) to tell the user of the forms that are still uncompleted. Because so much of the management of the OHMIS program involves the task of generating and completing OHMIS forms, the Outstanding Data Request List (013) generated from the DS22 data is expected to be a useful auditing tool for assessing the overall status of the OHMIS program in any OHMIS service area. It will also be useful to the OHMIS Data Processing Staff in each OHMIS service area as a data management tool.

DS22 data is generated by the program whenever the user requests that a 'blank' form be generated for use in data entry (as distinguished from generating a blank form for examination only), i.e., during Function F3A (Menu Selection Sequence 2.1.5). Only current DS22 data is maintained. The DS22 data is deleted when the data from the completed form is entered or when the user indicates that the form is not going to be completed (Menu Selection Sequence 3.1; Function F3B).

1. Completed form identifier (ID18). This is the identifier assigned by the program to the OHMIS form for which this DS22 data is monitoring completion.
2. Date this DS22 data was generated.
3. Is this form a Missing Data Element Types Form? Answers: Yes/No. (See the missing data element information data set (DS19) for the meaning of a Missing Data Element Type Form.) If the answer is 'Yes', the forms type code (CT9) given below is a fixed code (always the same) and there is no forms specification identifier (ID16).



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4. Forms type code (CT9) for the form being monitored, i.e., the form with the ID18 given above.
5. Forms specification identifier (ID16) for the form identified above.
6. OHMIS service area identifier (ID10) for the service area generating this form.
7. OHMIS user identifier (ID13) or position identifier (ID14) for the person to whom this form is to be sent, i.e., the person who is supposed to complete this form. This could be an employee identifier (ID4) if the person is not an OHMIS user or does not fill an OHMIS position. This identifier is obtained from the forms specification data (DS10) if the user/position who is supposed to complete the form has been specified; otherwise, it is obtained from the user when generating the form.
8. Employee identifier (ID4) for the above person. Obtained from the user/position identity and address data (DS9) for the above ID13 or ID14.
9. OHMIS user identifier (ID13) of the user who requested this data. For example, if the form was one that was filled out by a supervisor (the above identifier), this identifier would indicate who generated the request for the data on this form from the supervisor. This might be the Industrial Hygienist for the OHMIS service area or the Occupational Health Nurse or an equivalent user.
10. Employee identifier (ID4) for the above person.
11. The OHMIS user identifier (ID13) or position identifier (ID14) for the person who is supposed to review (sign off on) this form, if any. This could be an employee identifier (ID4) if the person is not an OHMIS user or does not fill an OHMIS position. This identifier is obtained from the forms specification data (DS10), if the user/position who is supposed to sign off on this form has been specified; otherwise, it is obtained from the user when generating the form.
12. Employee identifier (ID4) for the above person. Obtained from the user/position identity and address data (DS9) for the above ID13 or ID14.
13. Amount of time from the date that this set of DS22 data was generated at which this form will be considered to be overdue. May be from the DS10 data or may be specified by the user.

## DATA SET 22

Must be later than the date given above for the date that this set of DS22 data was generated.

14. Values (identifiers) for the up to 9 forms units on this form. For example, if this is a preemployment physical for an employee, the forms unit would be an employee identifier (ID4). The forms specification data (DS10) specifies the number and type of forms units for each forms specification. If this is a Missing Data Element Type Form, there would be a value for only one forms unit, that for which the missing data is missing.
15. If this DS22 data is for a Missing Data Element Type Form, up to 20 Missing Data Element Type Information Identifiers (ID21) for the data on the missing data element types.
16. The completed form identifier(s) (ID18) for the other form generated at the same time that this form was generated, if any. If this is DS22 data for a Missing Data Element Type Form, then the other form would be the form that was being generated at the time that this Missing Data Element Type Form was triggered (i.e., the form containing the forms units for which this Missing Data Element Type Form contains the currently missing data element types). If this is not a Missing Data Element Type Form, then this completed form identifier would be the identifier for the Missing Data Element Type Form or Forms (up to 9, one for each forms unit on the form begin generated), if any, generated at the same time that this form was generated.

## DATA SET 23

### Task Type Description Data

This data describes a particular type of task. A task type is a type of action that the OHMIS user has identified and described in order that the OHMIS program be able to use this information to automatically schedule action (Function F4) as these actions are triggered by requirements. Specifically, the OHMIS scheduling program (F4) uses information about tasks to schedule the action specified in the OHMIS requirements description data (DS1) when these requirements have been triggered as indicated by the generation of requirements implementation data (DS5). Whenever DS5 data is generated, the OHMIS program examines the DS1 data to determine if there is a task type code given (CT8) given, i.e., if the requirement is for an action that needs to be scheduled. If it is, the program uses the DS23 data to generate a set of specific tasks scheduling data (DS24) thereby scheduling the execution of the task associated with the triggered requirement.

A task type (CT8) which is described in the DS23 data is distinguished from a task identifier (ID23) which is described in the specific task scheduling data (DS24). An example of a task type is "conduct a Industrial Hygiene survey of a facility", while the comparable example of a task identifier would be "conduct an Industrial Hygiene survey in facility X on date Y". Thus the DS23 data provides the generic information about a task that is true for all executions of tasks of that type, while the DS24 data describes the specific characteristics of a particular execution of a task.

The DS23 data is entered by the user using Menu Selection Sequence 7.1. The DS23 data can be thought of as a thesaurus on task types (CT8), i.e., a fixed set of definitions about a task; like any definition this data must remain unchanged and apply universally in order to maintain the integrity of other parts of the OHMIS data base in which it is used. This data is not dated (does not have start or closing dates). The DS23 data cannot be deleted or changed. The same task type codes (CT8) apply throughout the OHMIS system, i.e., in all OHMIS service areas. However, there may be more than one DS23 data set for the same general type of task, if it is necessary to have the same tasks shown with different hours required for completing the task. For example, if one OHMIS service area finds that because of travel time or other reasons it takes 6 hours to conduct an average Industrial Hygiene survey, while in other areas it takes 4, the service area may generate a new set of DS23 data for the same task showing the greater number of hours for the task. This new DS23 data would have a new task type code (CT8).

1. Task type code (CT8). Unique value assigned by the program to distinguish this set of DS23 data.
2. Brief description of this type of task. This is the description used on summary outputs, such as the Daily Schedule (014) to briefly describe the task. This may be the

### DATA SET 23

same as the OHMIS vocabulary word/phrase that describes this task type code (CT8).

3. Detailed description of this type of task. Used to clarify to the user the exact nature of the task on nonsummary outputs such as the Scheduled Task Description (016). May include references to document identifiers (ID3) that give further explanations of this task.
4. Description of task to be used on the Scheduling Notice (015), i.e., to tell a participant in the task (not the person conducting the task) about the event (e.g., a medical exam for which he/she has been scheduled.
5. Description of preparation for this type of task. This is a narrative description of what is required to prepare to conduct the task. Would include reference to document identifiers (ID3) for further information, such as that contained in manuals, on how to prepare for the task. Includes the form type code of the forms that must be generated in order to complete the task (e.g., a facility survey form would be needed for the task of conducting an Industrial Hygiene survey).
6. Special instructions to a participant in the task (e.g., the employee being scheduled for a medical exam), if any, on how to prepare for the event covered by the task. An example would be an instruction not to eat breakfast on the day of the test.
7. Standard Number of time slots needed to conduct this type of test. A time slot is a quarter of an hour period. This information is used to schedule tasks of this type.
8. Calendar time allowed to complete this task. This is used to generate a due date for the task (unless the task already has a due date because it is for a requirement that was triggered by a suspense date, i.e., triggered by DS4 data). May be left blank if no length of time allowed to complete the task is to be specified.
9. Time use code (CT11) for the type of time use involved in completing a task of this type. In order to insure that tasks which are similar to each other are scheduled next to each other where possible, each type of task is classified according to the type of time use involved. In general these time uses will be based on the type of location in which the user must perform the task but other criteria can be used for classifying the tasks. Examples of such classifications would be "in the field", "in the OHMIS clinic", etc. The classification of tasks in this way reduces the number of

## DATA SET 23

instances in which the user is scheduled to perform a task in the field (e.g., an Industrial Hygiene survey) followed by a task in the Industrial Hygiene office and then followed by a third task back out in the field. When the user provides schedule availability data (DS26 and DS27), he/she indicates his/her "preferred time use" by placing a time use code (CT11) next to each time slot available for scheduling. This enables the user to ensure that the OHMIS program will schedule blocks of time according to his/her preferences, where possible, e.g., Monday/Wednesday/Friday in the field, Tuesday/Thursday in the office. The OHMIS program (Function F4) matches task types with a given time use code to the time slots that have been designated by the user with the same time use code.

10. Whether this type of task has any qualifications needed to perform it. Answers of 'No' would mean that all OHMIS users/positions in an OHMIS service area for which there is regular weekly schedule availability data (DS26) would go on the list of qualified employee identifiers (ID4) by task type (CT8) by OHMIS service area (DL34). If the answer is 'Yes', it means that the employee identifier of an OHMIS user or a person filling an OHMIS position must be on the DL34 list for this task type (CT8) for tasks of this type to be scheduled for performance by that employee. Note: The specifications for the type of OHMIS user/position (given below) allowed to conduct this type of task need not be filled, even if the answer to this field is 'Yes'. That is, it is possible to indicate that the users/positions performing this task must be qualified (i.e., must be on the DL34 list) without specifying what type of user/position are to be allowed to perform this type of task.
11. OHMIS user type code(s) (CT1) or the OHMIS position type code(s) (CT2) of the type(s) of persons who are to be allowed to perform this type of task. This identifies the type of OHMIS user/position who are considered to be "qualifiable (potentially qualified)" to perform this type of task. This field may be left blank if there are no specifications of the type of user/position to which the person performing this task must belong.
12. Description of the qualifications for performing this type of task, if any. May refer to document identifiers (ID3) giving more information about the qualifications required, if any, to perform this type of task.

The data on qualifications for the task type given in the above 3 fields is used to identify the employee identifiers (ID4) for the OHMIS users/positions who are qualified for the task. Once it is determined that a user/position is

### DATA SET 23

qualified, the employee identifier (ID4) for the user/position is placed on the DL34 list, (i.e., the list of qualified employee identifiers (ID4) by task type code (CT8) and by OHMIS service area), using Menu Selection Sequence 7.5.1. Menu Selection Sequence 7.5.1 for DL34 data checks to determine that the OHMIS user identifier (ID13) or position identifier (ID14) for the employee identifier (ID4) entered onto the list is consistent with the OHMIS user/position types (CT1/CT2), if any, that are given above in the DS23 data for the type of persons that are to be allowed to perform this task.

13. Whether this is a 'employee transport' type of task.  
Answer: Yes/No. Employee transport type tasks are those that require taking the employee away from his/her work site to perform the task. An example of such a task would be most medical examinations. On the other hand, the task of observing an employee in the work place (e.g., to see if the personal protective equipment assigned to the employee is being used correctly) would not be an employee transport type of task. The reason for identifying this characteristic of the task is that employee transport types of tasks have higher priority in scheduling; the OHMIS scheduling program (Function F4) is designed to schedule as many employee transport tasks for a given employee at one time (to the degree possible) and to avoid rescheduling such tasks to the degree possible.
14. Whether the scheduling of this type of task should trigger the generation of a Scheduling Notice (015). Answer: Yes/No. In general, a Scheduling Notice is needed for a task if performance of the task requires that a participant in the task come to a specific location or be at a specific location at a certain time. Medical examinations are a good example. All 'employee transport' type tasks will require Scheduling Notices, but other tasks may as well.
15. To which person is the Scheduling Notice (015) to be sent.  
Answers include: 1) The employee identifier (ID4) that is one of the requirement implementation units for the task; or, 2) The point of contact given in the contact and location data (DS28) on the employee, job class, facility and/or organizational unit that is one of the requirement implementation units for the task. More than one answer is possible.

## DATA SET 24

### Specific Task Scheduling Data

This data describes a particular specific task (as distinguished from a type of task as described in DS23 data) that has been scheduled (or for which an attempt has been made to schedule the task) by the OHMIS scheduling program (Function F4). This data is generated by the OHMIS program (Function F4) whenever a set of requirements implementation data (DS5) that is for an action requiring scheduling is generated, i.e., whenever a set of DS5 data is generated for a requirement for which the requirement description data (DS1) contains a task type code (CT8). The DS5 data indicates that a requirement has been triggered, i.e., the user is being asked to perform a certain required (or recommended) action. If this action is the type that requires scheduling (e.g., a task such as conducting an Industrial Hygiene survey), the task type code (CT8) for this action require scheduling is given on the requirements description data (DS1). Therefore, the generation of DS5 data for actions requiring scheduling automatically results in the OHMIS program scheduling a task of the task type (CT8) specified in the DS1 data (as a part of Function F4). The information about the scheduling of the particular task that is to be executed as a result of this triggered requirement is given in DS24 data.

Many of the data elements on the DS24 data are used to determine the priority of the task so that it can be scheduled accordingly. For example, tasks for requirements that are mandatory are given higher priority in the scheduling program (Function F4) than those for recommended requirements. Also, much of the information on the DS24 data is used to group like tasks together in scheduling. Specifically, it is desirable to group tasks being conducted in the same facility or being for requirements having the same requirements implementation unit identifiers together when scheduling. The DS24 data on the facility in which the task is to take place and on the requirement implementation unit for the requirement that triggered the task is used in order to facilitate the grouping together of tasks according to these factors. For example, the ordering of a new type of hazardous substance by an organizational unit will probably be set up by OHMIS users to trigger a requirement for investigating and developing corrective actions for this new hazardous substance for this organizational unit. In this case, the organizational unit identifier (ID12) is a requirement implementation unit. It is obviously desirable to do all other investigations of hazardous substances for this organizational unit (ID12) at the same time or, if that is not possible, to at least do all other tasks involving this organizational unit at the same time as this task.

Another example of the need to group tasks together when scheduling would be for what are called 'employee transport' tasks, i.e., tasks which require that an employee be taken away from his regular work site to participate in the task. If an employee were scheduled for a medical visit to the Occupational Health Nurse (an employee transport type of task) for more than one requirement (e.g., to follow-up on a corrective

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action and to conduct a routine physical) or for more than one one time during a quarter, it would be cumbersome and impractical to schedule the employee for separate Occupational Health Nurse visits for each task. To avoid this, the OHMIS scheduling program (Function F4A) "looks ahead" on upcoming requirements for the employee, using the list of requirement application identifiers (ID5) for requirements suspense data (DS4) by requirement implementation unit identifiers and OHMIS service area identifiers (DL32). An attempt is made to schedule the tasks for these requirements (i.e., requirements involving tasks that are employee transport tasks for the same employee) earlier than they would have been scheduled in order to group all requirements for the same employee together.

The user does not directly generate DS24 data; it is generated by the OHMIS program following the generation of DS5 data. If the user wishes to initiate the scheduling of a particular task, the user would input requirements suspense data (DS4) describing the task that is to be scheduled and the date the task is due. When this date (minus the 'prior notification time') arrives, the OHMIS program (Function F1A) will generate a set of DS5 data for the action and this will, in turn, result in the scheduling of the action. The user may change selected items of the DS24 data using Menu Selection Sequence 7.4.1.

DS24 data is deleted when the user enters data indicating that the requirement for which the task was triggered has been executed, i.e., when the user enters requirements disposition data in Menu Selection Sequence 1.5.3 (Function F2B). The user is not allowed to directly delete a task, because deletion of a task constitutes execution of the requirement which triggered the task and it is desired that this execution of requirements be documented in the disposition data for the requirement on the requirements implementation data (DS5) for the requirement. That is, the OHMIS program is designed to stipulate that a formal and documented decision be made to indicate that a requirement has been executed; therefore, the cancelling process of deleting a requirement in an undocumented way by deleting the task associated with the requirement from the schedule, is a data processing function not provided for in OHMIS. As a part of the 'log-on' transparent functions (Function 1A), the OHMIS program checks daily whether more than one week has past since the date that a task was scheduled. For any tasks for which this is the case, the program determines whether the DS24 data for the task has been deleted (i.e., the requirement has been executed, and, if not, reschedules the task).

1. Task identifier (ID23). A unique identifier assigned by the program to distinguish this set of DS24 data.
2. Date that this data generated, i.e., date that the generation of requirements implementation data (DS5) triggered this task. This date is included on the Daily Schedule (014) in order that the user may know for what length of time the task has been required. This is especially important for undated tasks (i.e., tasks without any due date), because these



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tasks have very low priority in the scheduling program and may be "bumped" several times before they are finally scheduled. It is important for the user to note how long a time it is taking for an undated task to be executed as this may indicate a scheduling problem for the OHMIS service area.

3. OHMIS service area identifier (ID10) for the area in which this task was generated. From the requirements implementation data (DS5) corresponding to the requirement implementation identifier (ID9) given below.
4. Task type code (CT8). Obtained from the DS1 ta (or from the DS4 data in the case of nonrequirement, , Reminder Notice, Suspense Data). Links the DS24 data the task type description data (DS23) which provides gener information about this type of task.
5. Supplement to the detailed description of the task. This is a narrative description giving further information about this specific execution of the task. Completion of this data element is not required. If the user desires to enter this information, it is done as a part of changing the DS24 data (Menu Selection Sequence 7.4.1).
6. Supplement to the description of the task given on the Scheduling Notice (O15). This provides additional information, beyond that provided in the DS23 data. This information is entered in Menu Selection Sequence 7.4.1. The OHMIS program will automatically generate a Scheduling Notice whenever a task is scheduled that has been identified in the DS23 data as requiring a Scheduling Notice. It is anticipated that the user (e.g., the Occupational Health Nurse) will examine each Scheduling Notice before it is sent and determine if there is any additional information needed that should be placed on this Notice. If there is, this additional information would be provided through making changes to the DS24 data (Menu Selection Sequence 7.4.1).
7. Supplement to the description given to a participant in the task (e.g., the employee being scheduled for a medical exam) on how to prepare for the task. An example would be "Do not eat breakfast on the morning of the test." This information is in addition to the special instructions given on the DS23 data to a participant in this type of task. Entered in Menu Selection Sequence 7.4.1.
8. Supplement to the description of the preparation for this task beyond that given in the DS23 data. Entered in Menu Selection Sequence 7.4.1.
9. Time use code (CT11) for the task. From the task type description data (DS23) corresponding to the above task type

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code (CT8); or the user can change this code using Menu Selection Sequence 7.4.1.

10. Facility identifier (ID8) for the location in which the task is to take place. This information is provided in order to enable scheduling of tasks that are to take place in the same locations at similar times. The ID8 may be derived from the facility data by task type (DS25) for the task type code (CT8) specified above. This facility can be specified in a generic way in the DS25 data because certain tasks (e.g., an Occupational Health Nurse medical test) will always be conducted in the same location and there will only be one location for conducting the task for a given OHMIS service area. If the ID8 is not available on the DS25 data, it may be one of the requirement implementation unit identifiers for the task; or, if there is no ID8 included among the requirement implementation unit identifiers, the ID8 may be obtained from the contact and location data (DS28) on the employee, job class, or organizational unit that is one of the requirement implementation unit identifiers. If none of these three types of identifiers are included as requirement implementation units, then the ID8 in this field cannot be determined automatically and is left blank. The user may add in or change the ID8 for the main facility in which the task is to be conducted using Menu Selection Sequence 7.4.1.
11. Requirement implementation identifier (ID9) for the requirement implementation data (DS5) which triggered the generation and scheduling of this task.
12. Identifiers for the up to 5 requirement implementation units for this task. From the requirement implementation data (DS5) corresponding to the above requirement implementation identifier (ID9).
13. Due date, if any, when this task is to be completed. This date comes from one of two places, either: 1) if the DS5 data corresponding to the above ID9 was triggered by a requirement suspense type of requirements applicability data (i.e., triggered by DS4 data), the due date would be 'next suspense date', plus the 'prior notification time' given on the DS4 data. If the DS5 data was triggered by either DS3 data (information triggered requirements) or DS17 data (allowable limits triggered requirements), the due date would be the current date plus the amount of time allowed to complete this type of task as specified in the task type description data (DS23), if any has been specified. Note that the due date for the task need not be the same for the requirement which triggered the task, because the requirement may involve more than completing the task.

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14. Whether or not this task is for a mandatory or for a recommended requirement. From the requirement description data (DS1) corresponding to the requirement identifier (ID6) on the DS5 data corresponding to the above ID9. Used to determine the priority of the task, when scheduling the task.
15. Whether or not this task was generated by requirement type suspense data (DS4) or Reminder Notice type suspense data. This information is on the DS5 data from which this task was triggered. This information is used to determine the priority of the task, when scheduling it.
16. Standard number of time slots (quarter hour periods) required to complete this task. From the DS23 data corresponding to the above task type code (CT8).
17. User specified number of time slots required to complete this task. This is the same as the standard number of time slots required, if no specifications have been made by the user. The user would make this specification using Menu Selection Sequence 7.4.1 (changes to the DS24 data). Such specifications would be made if the user felt that the standard amount of time allowed to complete this type of task (as specified in the DS23 data) was not correct for this particular execution of this type of task. Also, if the task had been scheduled, but only partially completed during the scheduled time period, the user would place an estimate of the time left needed to complete the task in this field, so that this value could be used in rescheduling the task (i.e., scheduling a time to complete what is left of the task), rather than the total time needed to complete the task. The OHMIS program uses the user specified required time slots for scheduling tasks. This value may be changed several times by the user before the task is fully completed.
18. Actual number of time slots scheduled for this task, including extra time slots required for interruptions.
19. Whether the user specified the schedule for this task.  
Answers: Yes/No. The OHMIS scheduling program (Function F4A) schedules tasks 'automatically'. However, the user can change the automatically determined schedule for a task by specifying the particular time slots for which the user wants the tasks scheduled. This done by changing the DS24 data using Menu Selection Sequence 7.4.1. This change in scheduling may be done to accommodate a particular user who is to conduct the task or to accommodate restrictions on scheduling the task arising from the acceptable time periods for the task for a participant in the task (e.g., the time the employee in a medical surveillance task has available). If the user specifies a time for scheduling a task, this schedule is given higher priority (i.e., is not as easily rescheduled) as those

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that are automatically scheduled. Therefore, it is important to note whether the schedule for the task was specified by the user.

20. Whether there are any restrictions on the time slots in which this task can be scheduled. Answers: Yes/No. Examples of such restrictions would be the fact that the employee scheduled to participate in the task (e.g., scheduled for a medical exam) regularly works the swing shift or that the employee is going to be on leave between such and such dates. Also, there may be restrictions on the times when it is possible to enter a facility (e.g., for tasks involving surveys of a facility).

There are two types of restrictions, referred to as standard restrictions and special restrictions. Standard restrictions are restrictions that "always" apply for the employee, facility, job class or organizational unit involved in the task. Restrictions due to the regular working hours or shifts of the employee or the hours in which a facility is regularly open would be typical examples of standard restrictions. The standard restrictions, if any, for an employee, facility, job class or organizational unit are given on the contact and location data (DS28) for the employee, facility, job class or organizational unit by identifying a set of weekly schedule data (DS26) containing the standard restrictions. The weekly schedule identified (ID28) for this set of DS26 data is entered onto the DS24 data when the DS24 data is generated.

Special restrictions are those that are peculiar to the particular task or that arise from non-routine situations. The finding that an employee will be on leave for a given time period, and, therefore, it is not acceptable to schedule the employee during that time period, would be an example of a special restriction for scheduling a task. Special restrictions are given on the DS24 data for the task. The user may enter special restrictions as a part of changing the DS24 data (Menu Selection 7.4.1). Information about the special restrictions may be obtained from the information given at the bottom of a Scheduling Notice (015). The bottom portion of a Scheduling Notice allows the person being notified of the task (i.e., the participant) to indicate that the time scheduled for the task is not acceptable and to give the other times on which the task cannot be scheduled (i.e., the restrictions) or a preferred time slot.

21. Three sets of from/to dates for the times that the task cannot be scheduled, i.e., restricted dates, if any. This information is a part of the special restrictions data described above. The sets of dates are given in the format of ranges, that is: equal to X, greater than X and less than Y,

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less than X and greater than Y, less than X and greater than Y (where 'X' and 'Y' are dates and 'less than' means before and 'greater than' means after the date.) Changes in the restricted dates may be made by changing the DS24 data (Menu Selection Sequence 7.4.1); such changes may result in rescheduling (Function F4B).

22. Weekly schedule identifier (ID28) for the weekly schedule indicating the times during the week that this task cannot be scheduled, i.e., the standard restricted times (as distinguished from special restricted dates). The DS28 for the employee, facility, job class or organizational unit participating in this task provides the weekly schedule identifier (ID28) for the task, if any. The standard restricted times are shown on the weekly schedule data (DS26) corresponding to the ID28. If there are no restricted times (either because there is no DS28 data on the participant in the task or because the DS28 data does not specify an ID28), this field is left blank. Changes in the weekly schedule identifier (ID28) are made by changing or adding the DS28 data for the participant in the task; such changes may result in rescheduling of the task (Function F4B).
23. Whether this task is currently scheduled and, if not, why not. The OHMIS scheduling program (Function F4A) will automatically schedule a task as soon as the requirement implementation data (DS5) for the task is generated, i.e., a requirement is triggered as soon as the next program 'log on' sequence (Function 1A) is begun. However, there are two reasons why it may not be possible to schedule a task: 1) the OHMIS service area in which the task is to be completed (i.e., in which the DS5 data originated) does not currently have any regular weekly scheduled availability data (DS26), i.e., there is not data to indicate that there are any users/positions with time available for scheduling in the OHMIS service area. This is not likely to happen, except during the start-up phases of the OHMIS system; 2) there are no users/positions in the OHMIS service area that have been listed as qualified to perform tasks of this type. The list of qualified employee identifiers (ID4) by task type (CT8) and by OHMIS service area (DL34) indicates which persons in an OHMIS service area are qualified to perform a task of a given type. If there is no such person in the OHMIS service area for this task, then it will not be possible to schedule the task.

This field indicates whether or not the task was scheduled and, if not, why in order that the task can be listed on the List of Unscheduled Tasks (017). Explanations for why it was not possible to schedule the task will be given in the form of codes, indicating: A) there are no qualified persons to perform the task in this OHMIS service area, or B) the qualified persons do not have any DS26 data for them. If code 'B'

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is used, the identify of the qualified persons for which there are no DS26 data sets would be given. It is possible that the reason the task is not scheduled is because it was necessary to reschedule the task. If so, a code of 'C' would be entered. A code of 'D' would indicate no attempt has yet been made to schedule this task.

The task identifier (ID23) for all tasks that cannot be scheduled goes on the list of tasks that cannot be scheduled (DL31) or, the list of tasks that need to be rescheduled (DL39) to await further information. Each day the OHMIS 'log-on' transparent function program (Function F1A) identifies the current tasks on the DL31 and DL39 lists (and the list of requirement implementation identifiers (ID9) for tasks for which there has been no attempt to schedule the task) and 'sends' these lists to Function F4A which attempts to schedule these tasks before the Daily Schedule (014) and the List of Unscheduled Tasks (017) is generated for that day. That is, each day in the Function F4A, the OHMIS program determines whether the user has entered the data needed to schedule an unscheduled task and, if so, schedules it.

Too many instances of not being able to automatically schedule a task is an indication of a scheduling problem. The problem may be that the mix of qualified personnel in an OHMIS service area is not consistent with the mix of tasks required for that service area. It is expected that each OHMIS service area will review the List of Unscheduled Tasks (017) periodically and determine if the number of unscheduled tasks is routinely excessive; attempts to correct the scheduling problem would then be made, if necessary.

24. Time slot information for the time at which this task is scheduled to begin. Time slot information consists of the monthly schedule identifier (ID27) and the date and quarter hour during the day (i.e., the time slot number from '1' through '96' indicating the quarter of an hour of the day) during which this task is scheduled to start. The monthly schedule identifier (ID27) identifies the monthly schedule data (DS27) that contains the user/position scheduled to perform the task and the year and month in which the task is to be performed. The time slot information is added to the DS24 data once the task is scheduled by the OHMIS scheduling program (Function F4A); at that time it is placed on both the monthly schedule data (DS27) covering all tasks for a user/position for a month and on the DS24 data covering a specific task. The OHMIS user identifier (ID13) or position identifier (ID14) and employee identifier (ID4) of the person scheduled to perform this task is given on the DS27 data referenced by the ID27 given in this field. This identifier must be on the list of qualified employee identifiers (ID4) by task type (DL34). The user may change the ID27 and task start

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time (i.e., specify his own schedule) for the task using Menu Selection Sequence 7.4.1. This will result in a rescheduling of the task (Function F4B).

25. Time slot information (ID27 plus date and time slot number) for which this task is scheduled to be completed, i.e., the end time for the task.
26. The number of interruptions in this task as it is currently scheduled, i.e., the number of times the task is scheduled to start but work on the task is scheduled to end before completion of the task because of a break for the end of a day, for a lunch period, for another task, etc. Answer may be '0'. The OHMIS scheduling program attempts to optimize the schedules for tasks to reduce the number of interruptions in the task. If interruptions are necessary, the program adds one time slot (quarter of an hour period) to the time required to complete the task for each interruption.
27. Whether this task is scheduled to be completed after the due date for the task. The OHMIS scheduling program is designed to maximize the number of tasks that are completed before the due date. However, if there are more dated tasks (i.e., tasks with due dates) then there are hours available for scheduling, the program will schedule the next task to start as close to the due date as possible. If the task is scheduled to be completed after the due date, this is noted in this field on the DS24 data so that the user can be alerted to this scheduling problem on the Scheduled Task Description (016) output. If any tasks for an OHMIS service area are found to be scheduled after the due date, this is an indication of a scheduling problem. There may not be enough hours available for scheduling for a given OHMIS service area or it is possible that the hours required for completing the tasks are too great compared to the hours available for scheduling. Another problem may be that the 'prior notification time' given on the suspense requirements data (DS4) is frequently too short a time so that tasks are not being scheduled sufficiently ahead of time that they are due to enable their scheduling before the due date.

Not all tasks have a due date. The only dated tasks are those triggered by the generation of requirements implementation data (DS5) that was triggered by DS4 data, i.e., tasks for date triggered requirements; or, tasks for which a length of time to complete the task has been specified in the DS23 data.

28. Whether all of the time slots scheduled for the task were scheduled at the preferred time use. Answers: Yes/No. The OHMIS scheduling program is designed to maximize the degree to which each OHMIS user is scheduled for tasks involving a given time use at the time that the user preferred to be scheduled

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for tasks involving this time use. However, there are three reasons why this may not always be possible. The scheduling program may override the user's preferred time use (i.e., schedule an available time slot for a different use than that preferred by the user) if: 1) this is necessary in order to schedule a task to be completed before its due date; or, 2) if the OHMIS service area does not have any user with a regular weekly schedule availability data (DS26) that includes the type of time use involved in the task being scheduled; or, 3) if scheduling the task according to the user's preferred time use would mean that there were excessive breaks in the time scheduled for tasks for that user; or 4) if not overriding the user's preferred time use would make it impossible to schedule an 'employee transport' task next to other 'employee transport' tasks for the same employee. Whether the user's preferred time use was overridden is indicated in this field so that this information can be provided to the user on the Scheduled Task Description (016) output in order to make the user aware of this scheduling problem. Too many instances of not being able to schedule the task according to the user's time use preference indicates a scheduling problem. This scheduling problem may result when the mix of time uses for all users in an OHMIS service area is not consistent with the actual time use mix required to complete all tasks being triggered for that OHMIS service area.

29. Whether more than one person has been scheduled to perform this task. Answers: Yes/No. The OHMIS scheduling program (Function F4A) only allows a task to be performed by one person, i.e., a task is not divided among several persons. However, if the user wishes two or more persons to perform a task at the same time, this can be specified by the user. This would be done for those tasks that require more than one person to perform them and, therefore, requires scheduling two or more persons to perform the task at the same time. The user identifies the additional person(s) performing the task in Step F4B-7 and the program fills in the monthly schedule data (DS27) for that person as a part of that Step.
30. If the answer to the above question was 'Yes', up to 3 sets of the following data elements for each of the other persons also scheduled to perform this task:
  - (1) Employee identifier (ID4)
  - (2) OHMIS user/position identifier (ID13/ID14) of the above person
  - (3) Monthly schedule identifier (ID27) for the monthly schedule data (DS27) on which this person is scheduled to start performing this task



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- (4) ID27 for OS27 data on which this person is scheduled to complete this task

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### Facility Data By Task Type

This data is used to identify the location in which tasks are to be performed in a given OHMIS service area, if it is possible to know this location for a task generically. This information is used to indicate the location of a task (e.g., a medical exam) on the Scheduling Notice (015) so that the participant in the tasks may know where to report for the task. It is also used in the OHMIS automatically scheduling program (Function F4) to provide information on the location of tasks so that tasks that are to be conducted in the same location can be scheduled together.

The DS25 data provides the location of task types, i.e., the generic location in which all tasks of a given type are to be conducted, not the location of a specific task. It will not always be possible to know of the location of a task type or for there to only one location for a given task type, but if it is possible to specify this one location, this information is provided in the DS25 data. This data is entered by the user using Menu Selection Sequence 7.6.1. This data may be deleted or changed at any time. However, at any point in time there can only be one set of DS25 data for a given task type (CT8) and OHMIS service area. The DS25 entry program will check for this upon entry of DS25 data.

1. Task type code (CT8) for which this data describes the location at which tasks of this type are to take place.
2. OHMIS service area identifier (ID10) for which this set of DS25 data is being generated.
3. Time use code (CT11) for this type of task. This is supplied from the task type description data (DS23).
4. Facility type code (CT7) at which tasks of this type are to take place. Examples of facility types would be "Occupational Health Nurse station", "hearing clinic", etc. This may be left blank if there is no CT7 assigned to the facility or if the facility at which this type of task is to be completed will only be defined in this set of DS25 data in generic terms (see below).
5. Generic description of facility. This field is given as an alternative to supplying the facility type code (CT7) and facility identifier (ID8) (below) when the exact location in which the task type is to be performed cannot be determined, but it can be described generically. Examples would be: "The place where the employee reports to work". Such loose definitions of facility types are used in the Scheduling Notice (015) for tasks in which it is not possible to specify the exact location of all tasks of this type,

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because specific executions of tasks of this type will be conducted in different places, but for which it is possible to describe the location generically. If this is the type of location information being given in this DS25 data, then only this field (i.e., the "generic description of facility") is provided on the DS25 data, i.e., no CT7 facility identifier (ID8) or facility address is given.

6. Facility identifier (ID8) for the facility at which the task will take place.
7. Complete address of the above facility, including room number, floor, etc.
8. Narrative description of any additional information needed about the facility to instruct persons on this location, e.g., directions, passes needed, etc. This information will be included on the Scheduling Notice (015) in order to enable this Notice to be used to instruct the employee on how to arrive at the proper location for the test or other task in which the employee is participating.

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### Regular Weekly Schedule Availability Data

This data, like the monthly schedule data (availability and use) (DS27), identifies the hours that an OHMIS user/position is available for scheduling and the preferred time use for each quarter of an hour available for scheduling. The DS26 data is used in conjunction with the DS27 data in order to make it simple for the user to enter his/her time availability and to make it possible to generate tentative monthly schedule data (DS27) without input from the user.

The OHMIS program allows the user to specify his/her regular schedule (i.e., normal work periods available for scheduling without regard to special situations such as holidays or vacations) on a weekly basis in the DS26 data. The user provides any variations required from this regular weekly schedule, such as exceptions needed for holidays, sickness, other absences of leave, etc. by making changes to the DS27 data that is generated for a month using the DS26 data. Thus, for example, the user may "normally" be available for scheduling for "in the field" tasks (i.e., a particular time use) from 8:00 a.m. to 12:00 p.m. on Mondays. This the user would show on a set of DS26 data. The OHMIS scheduling functions program (Functions F4) would use this entry on the DS26 data to schedule this time period for every Monday in a month in the time use specified by the user. If, however, on a particular Monday (January 3, 1983) the user will not be available during this time period or wishes to temporarily change the time use code for this time period, the user would indicate this by changing the DS27 data for the month containing January 3, 1983. Thus, the user is able to make temporary changes in his hours available for scheduling without changing his routine schedule. This will make it easier for the user to keep his normal schedule availability data up to date. It also makes it possible for the OHMIS scheduling program to generate tentative DS27 data (using the DS26 data) showing availability on a monthly basis (in Function F4C) without input from the user so that schedule availability data may be generated at any time that it is needed to add a new task to the user's schedule.

DS26 data is entered by the user during Menu Selection Sequence 7.2.1. A begin date and end date are placed on the DS26 data to indicate when this regular weekly availability schedule is to apply. A given user/position may only have one set of DS26 data covering a given period of time at a time, i.e., the begin and end dates for the DS26 data for the same user/position must not overlap. It should be noted that the entry of DS26 data on an employee is an indication that this user/position is available for scheduling of OHMIS tasks by the OHMIS scheduling program. All user/positions for which it is desired to have the OHMIS scheduling program schedule tasks must have DS26 data. Similarly, the deletion of DS26 data is the way that an employee is shown to be no longer available for scheduling. This would be done, for example, if the employee is to be terminated. To avoid having the OHMIS

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scheduling program continue to schedule tasks for an employee for the time between the date when the employee's termination is known and the actual termination data, the user would enter an end date on the DS26 data for the termination date. The OHMIS scheduling program would know from this end date information that no monthly schedule data (DS27) is to be generated from this set of DS26 data after the end date shown. Similarly, the user can achieve having the OHMIS scheduling program schedule tasks for user/positions that are not currently available in the OHMIS service area, but who will be available by a known date. This is achieved by inputting a set of DS26 data with a start date for the date in which the employee will be available for scheduling. The use of the end date and start date thus makes it possible to ensure that the employee is scheduled for OHMIS tasks immediately upon availability and not scheduled for tasks immediately upon knowledge of his/her change in availability for tasks.

The DS26 data is also used to show the standard weekly restrictions on scheduling for one or more persons or things. The contact and location data (DS28) for an individual or thing (e.g., facility) indicates whether there is a set of DS26 data showing the availability of employee or thing to participate in a task (as distinguished from performing a task). Thus, if an employee's shift meant that he would be available (e.g., for medical examinations) only between the hours of 8:00 p.m. and 4:30 a.m., Monday through Friday, there would be a set of DS26 data showing this availability information. Because more than one employee may have the same restrictions on availability, the same set of DS26 data is used to show availability for multiple persons and things (e.g., facilities); the weekly schedule identifier (ID28) on the DS28 data indicates which set of DS26 restrictions data applies to an employee or thing.

The OHMIS program (in Function F4C) uses DS26 data to generate a tentative monthly schedule (DS27 data) for the user, i.e., a schedule without any holidays, vacations, special monthly exceptions, etc. Whenever the DS26 data is changed (Menu Selection Sequence 7.2.3) or deactivated (Menu Selection Sequence 7.2.2), i.e., an end date is supplied, the OHMIS rescheduling program (Function F4B) makes the necessary adjustments in the user's monthly schedule data (DS27) for all months following the change in DS26 data.

1. Weekly schedule identifier (ID28). Unique value identifying this set of DS26 data
2. Whether this is a set of DS26 data used to show restricted times. See the contact and location data (DS28) for an explanation of this use of DS26 data.
3. Employee identifier (ID4) to which this set of DS26 data applies. Left blank if this DS26 data is used to show restricted times for a task.

## DATA SET 26

4. The OHMIS user identifier (ID13) or position identifier (ID14) for the above employee. Left blank, if no employee.
5. OHMIS service area identifier (ID10) for the above employee identifier (ID4) or the above task identifier (ID23), if this is a restricted times type of DS26 data set.
6. Start date for this DS26 data.
7. End date for this DS26 data. May be left blank.
8. Day of the week (Monday through Sunday, 1-7).
9. For each day of the week:
  - 9a) Time slot number (1 to 96) for each day of the week, there are 96 time slots (one for each quarter of an hour period in a day). Thus, 2:15 p.m. would be assigned the time slot number of '58'.
  - 9b) Whether any time slots in the day are available for scheduling. Answers: Yes/No
  - 9c) For each of the 96 time slots in a day:
    - i) Whether the time slot is available for scheduling. Answer: Yes/No. Examples of regular time not available for scheduling would not only be lunch hours and hours not on the job, but also hours set aside for handling nonscheduled tasks, e.g., processing an injury/illness report. If the answer to 9a) was 'No', then this answer must be 'No'.

Only regular schedule availability is shown on the DS26 data, i.e., the schedule that the user wishes the OHMIS program to use to generate a tentative monthly schedule (DS27) for any month in the future. Changes in the regular weekly schedule, unless they appear to be the type that will last for an extended period of time (at least two months) should not be made on this data. This is because the OHMIS program uses the DS26 data to generate monthly schedules of DS27 data at least two months in advance (further in advance if the user enters advance scheduling data on the monthly schedule data (DS27)). Exceptions to the regular time available for scheduling are indicated by making changes to the DS27 data (Menu Selection Sequence 7.3.1).

## DATA SET 26

If this is a restricted times type of DS26 data set, this field contains the answer Yes/No for whether this time slot is restricted.

- ii) For each of the 96 time slots identified above as available for scheduling, the preferred time use code (CT11). This code was explained in the task type description data (DS23). In the DS26 data set, the CT11 allows the user to specify what general types of tasks are to be scheduled for each quarter of an hour available for scheduling. Left blank for restricted times type of DS26 data.

## DATA SET 27

### Monthly Schedule Data (Availability and Use)

This data describes both the schedule availability data for a given month and user and the actual planned use of the hours available for scheduling for that month and user to the degree that they are known as of the current date. Based on the regular weekly schedule availability data (DS26) provided by the user, the OHMIS program generates a tentative availability schedule (DS27 data) for the month (Function F4C), i.e., the schedule of what hours the user has available for scheduling tasks and what the user's preferred time use for these time slots is. The user may modify this monthly availability data on the DS27 to fit the particular circumstances of the month (i.e., for variations from the regular weekly schedule shown on the DS26 data) using Menu Selection Sequence 7.3.2. In the OHMIS program Function F4A, specific tasks are scheduled (i.e., the DS27 data is "filled in") to fit the availability shown on the DS27 data. The DS27 data thus shows for any given month the time available and the time already scheduled for the OHMIS user/position.

The DS27 data is generated by the OHMIS program once a month for enough months (i.e., 0, 1 or 2 months) to ensure that there is DS27 data for each OHMIS user/position for 2 months in advance using the DS26 data. (The time and the month that this generation of DS27 data takes place is arbitrary, but it is advisable to have a fixed date in order that the users may be informed so that any changes in the regular weekly schedule data (DS26) can be made before the DS27 data is generated.) This routine generation of DS27 data is triggered as a part of Function F1A, but is done in Function F4C. However, it may not be necessary to generate any new DS27 data at this routine point in time, because this data may have already been generated by the OHMIS program as a part of inputting deletions or changes to the monthly schedule data (DS27) during Function F4B. For example, if the user wishes to enter a vacation schedule 4 months in advance (using Menu Selection Sequence 7.3.2), the OHMIS program will generate a monthly schedule data (DS27) for the user for each of the four months up and including the month that the user wishes to enter schedule availability changes for. Similarly, if, in the process of scheduling a task, all of the time availability for all users for a given time period has already been scheduled, the OHMIS scheduling program (Function F4A) will generate additional monthly schedule data (DS27) for as many months into the future as is necessary to enable scheduling of the task. Because of these two other occasions in which DS27 data is generated, it may not be necessary to generate any DS27 data for a user at the routine time once a month, i.e., as a part of the log on transparent function (Function F1A).

DS27 data is deleted one week after the end of the month covered by the DS27 data. Every day, as a part of the log on transparent function (Function F1A) the OHMIS program will examine those tasks that were scheduled to be performed on the date one week previous to the current date. If the task has been executed (i.e., if the requirement disposition data on the requirement that generated the task has been



## DATA SET 27

entered using Menu Selection Sequence 1.5.3; Function F2B) and therefore the specific task scheduling data (DS24) has been deleted for the task, then nothing is done. If not, the task is rescheduled. When the tasks scheduled for the last day of the month have been examined in this way (i.e., one week after the end of the month) and all tasks that have not been completed have been rescheduled, the DS27 data is deleted.

1. Monthly schedule identifier (ID27). Unique value assigned by the program to distinguish this set of DS27 data. User may examine or change or delete the DS27 data (Menu Selection Sequence 7.4) by referring to this number or may indicate the DS27 data of interest by providing the user/position identifier (ID13/ID14) and the year and the month for the schedule. The ID27 is used in other data sets to indicate with one value the following information: The user/position of the person scheduled to perform a task and the year and month in which the task is scheduled. To provide the complete information on when a task is scheduled to start or end it is necessary to provide the ID27 plus the date, hour and quarter of an hour. This complete set of information is referred to as a time slot.
2. OHMIS service area identifier (ID10) for which this is a monthly schedule.
3. Year for which this is a monthly schedule.
4. Month for which this is a monthly schedule.
5. The employee identifier (ID4) for the person for whom this is a monthly schedule.
6. OHMIS user identifier or position identifier (ID13/ID14) for the person for whom this is a monthly schedule. From the current user/position identity and address data (DS9) for the above employee identifier (ID4).
7. Date (number from 1 to 31) of the month.

The following 3 sets of data elements for each of the dates of the month:

7.1) The day of the week for this date (Monday through Sunday).

7.2) Whether any part of this day is available for scheduling.

The availability data on the regular weekly schedule availability data set (DS26) for the employee for which this set of DS27 data is a monthly schedule and the day of the week given above is used to identify those quarter of an hour periods (time slots) that are available for scheduling. Answers: Yes/No. If none of the time slots

## DATA SET 27

are available for scheduling on this day, the answer is 'No'; otherwise, the answer is 'Yes'. Also the user may change the hours available for scheduling as a part of changing the DS27 data (Menu Selection Sequence 7.3.2) or the DS26 data (Menu Selection Sequence 7.2.3).

- 7.3) Each day of the month has 96 time slots signifying the hour and quarter of an hour in the day.

Each of the 96 time slots have the following data elements:

- a) A time slot number (1-96).
- b) Whether the time slot is available for scheduling.  
Answers: Yes/No

For each time slot identified above as available for scheduling:

- c) The preferred time use code (CT11) for the time slot. From the DS26 data or changed by the user using Menu Selection Sequence 7.3.2 or 7.2.3.
- d) The task identifier (ID23) for the task that has been scheduled for this time slot, if any has been scheduled to date.

For each time slot identified above as being one for which a task has been scheduled:

- e) Time use code CT11 for the task with the ID23 from above. This may not be the same as the preferred time use code for the time slot given above if it was not possible to schedule this time slot according to the user's preferred time use for the time slot. (This is called the actual time use for the time slot in some Functions.)
- f) Whether the scheduling of the task is the one specified by the user. Answer: Yes/No. The OHMIS scheduling program (Function F4A) will 'automatically' schedule each task. However, the user may change the scheduling of a task by changing this information on the DS24 data for the task (Menu Selection Sequence 7.4.1), if desired. Such schedules for a task that are determined by the user are given higher priority and are rescheduled; therefore, the fact that the schedule is one specified by the user is noted here. From the DS24 data for the task.

## DATA SET 27

- g) Whether there are any restrictions on the time that this task has been scheduled. Answers: Yes/No and, if 'Yes', whether the restrictions are standard restrictions, special restrictions, or both. From the DS24 data. This information indicates whether the DS24 data needs to be checked for these restrictions, if it should become necessary to reschedule the task.
- h) The total standard number of time slots required to schedule this task. From the DS24 data.
- i) The total number of user specified time slots that are required to complete this task. From the DS24 data. The amount of user specified time slots to complete the task would only be different than the total standard amount of time to complete the task, if the user had changed this value on the DS24 data. This would be done, if the user felt that more time was needed for this particular execution of the task than would regularly be scheduled for a task of this type. The user specified required time slots to complete a task would also be different from the standard required time slots, if the user had previously started completing the task and had not completed in the scheduled time period and had, therefore, changed the amount of time required to schedule this task to the amount of time left needed to complete this task. The standard required time slots and user specified time slots for completing a task are the same if the user has not specified any user specified required time slots.
- j) The actual number of time slots required to schedule the task in the way that is scheduled on this DS27 data. One time slot is added to the time slots required to schedule a task for each interruption in the scheduling of the task.
- k) Due date for this task identifier (ID23). This information comes from the specific task scheduling data (DS24) for the above task. This information is used to determine by what date the task being scheduled has to be completed in order to meet the due date. The scheduling program (Function F4A) attempts to arrange the scheduling for all tasks so that they are all completed before their due date.

There may not be any due date for a task. Only tasks triggered by requirements implementation data (DS5) that was generated from requirements suspense data (DS4) or tasks that have a specified length of

## DATA SET 27

time for completing them given in the task type description data (DS23) are dated. The DS24 data on each task indicates whether it is a dated task by giving the due date for the task.

- 1) For tasks triggered by DS5 data generated from suspense requirements data (DS4 data), whether the DS4 data was for a requirement type of suspense for a Reminder Notice type of suspense. Answer: Yes/No. Reminder Notice type of DS4 data trigger actions that are not based on any requirement or recommendation, i.e., not linked to requirement (recommendation) description data (DS1). Although these tasks do have due dates, the meeting of these dates is not as critical as it is in a required dated action and therefore, in scheduling, other tasks are not bumped to a later date to meet the due date for Reminder Notice (nonrequirement) type suspenses. The OHMIS scheduling program gives higher priority to required tasks that are dated and will, for example, "bump" nondated tasks to a later date, if necessary to enable scheduling of required dated tasks before the due date. The DS24 data for the above task identifier (ID23) indicates whether the task is generated from Reminder Notice types requirements suspense data (DS4).
- m) If the task is not a Reminder Notice type of task, whether the task is based on a mandatory requirement or a recommended requirement. Again, this is used to determine priority in scheduling. From the DS24 data for the task.
- n) Whether a task is an 'employee transport' type of task, i.e., one that requires taking the employee participating in the task away from his/her work site. Employee transport tasks that are already scheduled have the highest priority in scheduling. They will not be bumped for any other task. Also, this information is used to attempt to schedule all employee transport type tasks for a given employee (including all tasks scheduled for up to three months in advance) at the same time.
- o) Whether this task is one for which a Scheduling Notice (015) is required. From the DS23 data. Tasks that require Scheduling Notices are given higher priority (i.e., are not rescheduled as readily) than those which do not require these notices because rescheduling of the tasks means resending a Scheduling Notice. Therefore, this characteristic of the task is noted here.

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- p) The cumulative number of time slots scheduled for this task as of this time slot. For example, a task that takes five time slots to schedule would have the first time slot scheduled with the cumulative number of '1' in this field, the second time slot scheduled would have a '2' in this field, etc.
- q) The cumulative number of interruptions in the scheduling of this task as of this time slot. Interruptions are breaks in the continuous scheduling of a task, e.g., if a time slot for the end of the work day arrives before the last time slot used to schedule this task, this would be an interruption in the scheduling of the task. One time slot is added to the number of time slots required to complete the task for each interruption in the task.
- r) Whether the above task is continued to other time slots, i.e., the time required for scheduling the task is greater than this one quarter of an hour time slot. Answers: Yes/No. This field is especially important in processing scheduling data because it indicates whether there are interruptions in the scheduling of a task, i.e., it identifies tasks that have breaks or other tasks scheduled between the start and stop time for the task.
- s) Time slot information for the next time slot in which this task is scheduled. Time slot information is a monthly schedule identifier (ID27), a date (1-31) and a time slot number (1-96, indicating the quarter of an hour of a day). This information tells the reader of the monthly schedule which time slot is the next time slot scheduled for the completion of this task after the time slot being described in this set of fields. This allows the program to know to which time slot to go in order to identify and locate all time slots scheduled for a task.

## DATA SET 28

### Contact and Location Data

This data describes information about how to contact or locate a person. It also identifies and describes how to locate the person to contact regarding occupational health program matters with reference to inanimate things; for example, the person to contact for information about a facility or a job class is identified on the DS28 data. The DS28 data is distinguished from the current user/position identity and address data (DS9) in that the DS9 data only provides contact and location information for users of OHMIS and for positions routinely contacted in the use of OHMIS, e.g., the mailing address of the personnel office, while the DS28 data provides contact and location data for all other persons and for some things.

The primary purpose of the DS28 data is to identify the person(s) that should be notified about an occupational health program action, i.e., the persons sent a Scheduling Notice (Output 015) for a task triggered by OHMIS. The DS28 data also serves to identify any standard (i.e., routine) restrictions on the scheduling of tasks for the person or thing covered by the set of DS28 data. It is expected, however, that the DS28 data may be used for numerous routine occupational health program functions that require information on how to contact individuals, e.g., sending training materials to employees.

The DS28 data is entered by the user using Menu Selection Sequence 8.2.1. This data can be changed or deleted by the user. Only current DS28 data is maintained. It is expected that each OHMIS service area will have their own series of sets of DS28 data. Because it is possible to have one set of DS28 data for each employee (and possibly for each facility, job class, organizational unit and other things for which contact and location information are needed) in an OHMIS service area, it is expected that an automated method for generating the DS28 data (using an external data source such as a personnel information system) will be developed.

1. Contact identifier (ID26). Unique value assigned by the program to distinguish this set of DS28 data.
2. OHMIS service area identifier (ID10) for the service for which this set of DS28 data provides contact and location information.
3. Identifier of the person or thing about which this set of DS28 data provides contact and location information. This can be an individual (ID4), a job class (ID7), a facility (ID8), an installation (ID11), an organizational unit (ID12) or other similar types of identifiers of persons or things or groups of persons or things about which it is useful to maintain contact and location data.

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4. Employee identifier (ID4) of the person to contact for information about the above identifier. If the identifier given above was a person (i.e., an employee identifier (ID4)), this ID4 may be the same as that employee identifier, but it is not necessarily the same. For example, the contact person for an employee with regard to the occupational health program may be the employee's supervisor, rather than the employee himself. As the DS28 data is used primarily to determine to whom to send Scheduling Notices (O15) for OHMIS tasks, the appropriate person for sending these Notices to should be used here.

If the above identifier was not for a person, this employee identifier (ID4) would be the person to contact about occupational health issues for the above identifier. For example, a facility may have a person to contact in order to notify the person responsible for the facility of an industrial hygiene survey (e.g., to gain access) or to inform the person responsible for the facility of a needed corrective action. Similarly, there may be a need to identify a person to contact for information about a given job class (e.g., to obtain updated information about hazards about the job class).

5. Work address information for the above person. This information can include the title of the person, mailing address, phone, etc. The mailing address can be the abbreviated form of mailing information used internally in the Department of the Army (i.e., office identifier and mail slot). Depending on the nature of the particular occupational health programs implemented, it may be found desirable to include a home address for employees as well as a work address.
6. Whether there are any standard restrictions on the scheduling of tasks for the above identifier. The OHMIS scheduling program (Function F4) assumes a 24-hour day, 7-day a week work schedule in order to allow for those installations in which multiple shifts of occupational health services are provided. In order not to schedule a person or thing to participate in a task during a time period in which the person or thing is regularly known not to be available (i.e., known to not be on a work shift), the program identifies those time slots that the person or thing is not available to participate in tasks on a set of weekly schedule identifier data (DS26). For example, an employee may work the swing shift and only be available for medical examinations during the swing shift hours; the remaining hours will be restricted hours. Similarly, there may be certain facilities for which it is not possible to enter or conduct industrial hygiene surveys at all times; the times where it is not acceptable to do so would be identified as restricted times. Only standard restrictions are referred to here, i.e., restrictions that routinely apply.

## DATA SET 28

If there is a period of time that the person or thing is normally available for scheduling, but will not be available for scheduling temporarily (i.e., while the person is on a leave of absence) this would be shown on the specific task scheduling data (DS24) for the task(s) in which the person or thing is currently scheduled to participate.

7. If the answer to the above question was 'Yes', the weekly schedule identifier (ID28) for the regular weekly schedule availability data (DS26) containing information about the restricted times. It is expected that in many cases the exact same standard restrictions on scheduling will apply to large numbers of persons and/or things. Thus, for example, all employees working on a given shift would have the same restrictions on times for scheduling. Also, the working hours may be known for an entire OHMIS service area or installation. For this reasons, the restricted times are not entered for each person or thing, i.e., it is not entered on each set of DS28 data. Instead, the DS28 data for an individual or specific thing refers to one set of regular weekly schedule availability data (DS26) that contains the restrictions information applying to that individual or thing. Thus, multiple individuals or things may refer to the same set of DS26 data for information about restricted times.



## 6.7 OUTPUTS

The following are the description of the Outputs that are used in the Functional Data Flows describing the core OHMIS data processing functions.

## TITLES OF OUTPUTS

| <u>Output Number</u> | <u>Output Title</u>  |
|----------------------|--|
| 01                   | Requirements Check Notice  |
| 02                   | Outstanding Requirements Checks Needed List  |
| 03                   | Requirements Notification and Certification Record                                   |
| 04                   | Outstanding Requirements List (see DL3)  |
| 05                   | Reminder Notice List (see DL9)   |
| 06                   | Vacant Job Class List (see DL1)  |
| 07                   | Potential New Hire List (see D12)  |
| 08                   | New Hire List (see DL4)  |
| 09                   | Allowable Limits Check Notice  |
| 010                  | Outstanding Allowable Limits Checks Needed List                                      |
| 011                  | Allowable Limits Evaluation Summary  |
| 012                  | OHMIS 'Blank' Form (see Form Types) [Generic Description of All OHMIS 'Blank' Forms] |
| 013                  | Outstanding Data Requests List (see DL27 and DL28)                                   |
| 014                  | Daily Schedule   |
| 015                  | Scheduling Notice  |
| 016                  | Scheduled Task Description   |
| 017                  | List of Unscheduled Tasks  |

## OUTPUT 01: Description

### Requirements Check Notice

The Requirements Check Notice is used to tell the user (OHMIS Data Processing Staff) that a particular triggering step has been executed and that information triggered requirements (DS3 data) potentially associated with this triggering step have been identified, but insufficient information is available to be certain and that, therefore, a requirements check (Menu Selection 1.2.3; Function F2A) should be made. The notice provides a description of the potentially applicable requirements for which the user will be checking applicability as a part of the requirements check requested by this Requirements Check Notice. Potentially applicable requirements are those requirements which have passed all of the applicability criteria for those applicability variables for which the values were available in the OHMIS data base at the time that the triggering step initiating this requirements check request was executed. The 01 output also provides the reason why this requirements check was triggered and the values for the requirement implementation units, i.e., a unit such as an employee or a facility to which the potentially applicable requirements may apply, for which this requirements check is to be executed. The notice also tells the user the types of data elements that the user should have available when executing the requirements check in order to be able to provide the data needed to determine if the requirements are applicable, i.e., the applicability characteristics data element type for which the OHMIS requirements check program was not able to obtain from the current OHMIS data base at the time that the triggering step was initiated. The user must be prepared to enter the values for these data elements (i.e., the values for the requirements applicability characteristics (DS8)), when making the requirements check, so that the program can identify the applicable requirements. The Requirements Check Notice identifies those requirement applicability characteristics data elements for which the current OHMIS data base does not have values, i.e., those for which the computer program could not "automatically" obtain the values at the time of the requirements check request data (DS2) was generated.

Generation of Output: Most of the 01 data is generated from the requirements check request data (DS2). The output is generated by the user through Menu Selection Sequence 1.2.1. Request for this type of output can be for several subsets of requirements check request data (DS2), including:

- o All Requirements Check Notices (01) for a given OHMIS service area identifier (ID10); the ID10 is on the Requirements Check Request Data (DS2). As DS2 data is only kept for outstanding requirements check requests (i.e., those checks that have not been executed, this selection criteria of the 01 output would yield all uncompleted requirements checks applicable to a given OHMIS service area.

### OUTPUT 01: Description

- o A specific requirements check notice as specified by the user using the requirements check request identifier (ID1) which is obtained by the program from the requirements check request data (DS2) and provided to the user on the Outstanding Requirements Checks Needed Lists (02).
- o The Requirements Check Notice (01) for requirement check request data triggered between a specified range of dates. The date on which the requirements check request was triggered is obtained by the program for the requirements check request data (DS2).
- o The Notice for all requirements checks triggered by a given triggering step. The triggering step is given on the requirements check request data (DS2).

Data for the 01 output shown on the following mock up is obtained from the requirements check request data (DS2) for the particular requirements check request identifier (ID1) shown on the output, unless otherwise specified in the mock up.

OUTPUT 01: Mock Up

TITLE: Requirements Check Notice

1. Instructions to the user on how to use this output, i.e., that the user must execute a requirements check in which the values for the missing applicability characteristic types (variables) shown below will be supplied by the user and the program will then use these values to determine if there are any applicable requirements. Includes how to execute a requirements check (Menu Selection Sequence 1.2.3). This data is the same for all Requirements Check Notices.
2. Requirements check request identifier (ID1).
3. Date this requirements check request was triggered.
4. OHMIS service area identifier (ID10) from which this requirements check request originated.
5. Triggering step identifier (ID2) for the triggering step in which this requirements check request was generated.
6. Description of the triggering step. Obtained from the triggering step identifier (ID2) data. This information informs the user of the occasion (i.e., the data processing function) that triggered a request for a requirements check, e.g., that the user added a job class to the vacant job class list (DL1).
7. Data element types and values for the requirement implementation units entered during the execution of the above referenced triggering step. This data provides further information on the particular data processing function that triggered this requirements check request, e.g., the specific job class that was added to the vacant job class list.
8. The requirement identifier (ID6) and brief requirement description for each potentially applicable requirement included in this requirements check request. The requirement identifier is obtained from the values data for requirements applicability characteristics (DS8) for each potentially applicable requirement, i.e., for each set of DSJ data for the above referenced requirements check request identifier (ID1). This information tells the user what potentially applicable requirements are to be checked for in the requirements check requested by this Notice, thus, informing the user of the significance of this requirements check.
9. The data element types on the list of requirements applicability characteristics for which values are missing (DL5) for the above referenced requirements check request identifier (ID1). This list

OUTPUT 01: Mock Up

tells the user what types of data elements he/she should have available in order to fill in the missing values as a part of executing the requirements check. Once these missing values are supplied by the user during a requirements check, the program (Function F2A) will be able to check whether any of the potentially applicable requirements are in fact applicable by matching these values to the specified applicability characteristic values for each potentially applicable requirement.

OUTPUT 02: Mock Up

TITLE: Outstanding Requirements Checks Needed List

1. Instructions to the user on how to use this output. Includes telling the user to use this summary to obtain the complete information on the requirements check request by generating the Requirements Check Notice (01) for the requirements check request identifier (ID1) given on this list.
2. The triggering step identifier (ID2) for which this constitutes a list of requirements checks needed as specified by the user. The output would read 'all', if not specified by the user.
3. Date this output was generated.
4. OHMIS service area identifier (ID10) for which this is a list of requirements checks needed. This identifier is specified by the user; or, (for automatically generated 02 output), determined by the program based on the OHMIS user identifier (ID13) and at the beginning of the log on program sequence in which this output was generated.
5. For and to dates for the time period covered by the requirements check requests listed, i.e., the time period between which a requirement check request needs to have been triggered for it to be listed on this output. Specified by the user or the word 'all'.
6. Four columns of data listing the following selected data elements for all specified requirements check request data sets (DS2):
  - 1) Requirements check request identifier (ID1).
  - 2) Date on which the requirements check request was triggered.
  - 3) Triggering step identifier (ID2) for the triggering step in which this requirements check request was generated.
  - 4) Description of the triggering step. Obtained from the triggering step identifier (ID2) listed above.

## OUTPUT 02: Description

### Outstanding Requirements Checks Needed Lists

This output lists selected data elements from the requirements check request data (DS2) for all requirements check requests made for a given OHMIS service area. The purpose for the output is to provide the user with a summary list of all requirements check requests that have been triggered (by executing triggering steps), but which have not yet been conducted. The list is generated daily and thus acts as a check list telling the user of requirements checks that need to be made for that day. Further information on the requirements check requests can be obtained from the Requirements Check Request Notice (01) using the requirements check request identifier (ID1) which is given on 02. Because the requirements check request data (DS2) is deleted when the requirements check (Menu Selection Sequence 1.2.3; Function F2A) is executed, there is data in the OHMIS data base only on uncompleted requirements checks.

Generation of Output: Most of the OHMIS data is obtained from the requirements check request data (DS2). The output is generated in two ways:

- 1) 'Automatically' (see Function F1A): The complete 02 list (all requirements check request data for an OHMIS service area identifier (ID10)) is generated once each day that the OHMIS Data Processing Staff person for the service area logs onto the OHMIS system. The log on program keeps track of the last date on which the 02 list was generated and compares it with the current date each time a user with an OHMIS user identifier (ID13) that is for a data processing staff type of user (CT1) enters the system for a given OHMIS service area. The list is generated for the OHMIS service area identifier (ID10) associated with the OHMIS user logging onto the system, using the OHMIS user identifier by service area list (DL6).
- 2) Upon the request of the user, using Menu Selection Sequence 1.2.2. The user may specify that this output includes:
  - o All requirements check requests for a service area (ID10).
  - o Requirements check request generated between a specified range of dates.
  - o Requirements check request for a given triggering step (ID2).



## OUTPUT 03: Description

### Requirements Notification and Certification Record

This output notifies the user of a particular requirement (recommendation) that needs to be implemented and provides a blank form for completing (manually) the disposition data on the requirement, i.e., data on who executed the requirement and what type of execution of the requirement took place. This output may thus become a hard copy record containing disposition data. If, for example, it is desired to keep a permanent hard copy record of the signatures of the persons who executed the requirement and approved the disposition of the requirement, this output would be the document that was kept. The requirement description data (DS1) for the output specifies whether such a hard copy record of the 03 output is to be maintained.

This output provides a description of the requirement and the Menu Selection Sequence steps, if any, involved in conducting the data processing steps needed to execute the requirement. It also indicates any additional checks that should be executed to determine if the requirement is applicable and the Menu Selection Sequence for conducting the data processing steps, if any, involved in making these additional checks. The data entry portion on this output provides a means for the user to manually complete the disposition on the requirement. The value for the disposition data entered on this output are entered into the OHMIS data base as a part of the requirement implementation data (DS5), using Menu Selection Sequence 1.5.3 (Function F2B).

Generation of Output: The data from the 03 output comes primarily from the DS5 data. The requirement description data (DS1) corresponding to the requirement identifier (ID6) given on the DS5 data is another major source of data for this output as are the requirements applicability data (DS3, DS4 or DS17) corresponding to the requirements application identifier (ID5) given on the DS5 data.

The output is generated by the user through Menu Selection Sequence 1.5.1. Requests for this type of output can be for several subsets of the DS5 data, including:

- o All Requirement Notification and Certification Records (03) for a given OHMIS service area identifier (ID10). The ID10 is on the DS5 data. This would only include 03 records for requirements that have not yet been executed as identified on the Outstanding Requirement list (DL3).
- o A specific 03 as specified by the user using the requirement implementation identifier (ID9) which is obtained from the DS5 data and provided to the user on the Outstanding Requirements List (04). All 03s for requirements for which the requirement implementation data (DS5) was generated (i.e., the requirement was triggered), between a specified range of dates. The data is obtained from the DS5 data.

OUTPUT 03: Description

- o All 03s for requirements of a given OHMIS requirement type code (CT3). This code is from the DS1 data.
- o All 03s for requirements of a given requirement identifier (ID6). From the DS5 data.
- o All 03s that are supposed to be executed by a given OHMIS user type (CT1) or position type (CT2). From the DS1 data.
- o All 03s that are supposed to be executed by a given OHMIS user identifier (ID13), position identifier (ID14) or employee identifier (ID4). From the DS5 data.
- o Same as above to selection criteria except for the person who is supposed to supervise the execution of the requirement (i.e., receive notices about the requirement).
- o Same as the above to selection criteria except for the person who is supposed to approve the disposition of the requirement.

## OUTPUT 03: Mock Up

### TITLE: Requirement Notification and Certification Record

1. Instructions for how to use this output. Includes how to get more information about the requirement by examining the requirements description data (DS1) through Menu Selection Sequence 1.1.2 and how to get more information about the applicability of the requirement by examining the appropriate DS3, DS4 or DS17 data.
2. Requirement implementation identifier (ID9) for the requirement implementation data (DS5) for which this Record was generated.
3. Date that the requirement was triggered, i.e., the date that the requirement implementation data (DS5) was generated. From the DS5 data.
4. Document identifier type code (CT6) assigned to all Requirement Notification and Certification Records (03) and the type of OHMIS document.
5. Document identifier (ID3) assigned to all Requirement Notification and Certification Records (03s) generated for the above requirement implementation identifier (ID9). This is a unique value assigned by the program to distinguish this record from other 03 records. This value is assigned at the time that the DS5 data is generated from the list of available document identifiers (ID3), rather than at time that the 03 is generated, in order to have the same document identifier on all generations of an 03 output for a given set of requirement implementation data (DS5), to allow for the fact that the same 03 output may be generated several times.
6. Length of time that the completed version of this 03 record must be maintained. Tells user whether or not the hard copy of this 03 record must be retained in order to document the requirement's execution and approval signatures and, if so, for how long. From the DS1 data.
7. OHMIS service area identifier (ID10) to which this requirement applies. From the DS5 data.
8. The OHMIS user identifier (ID13) or position identifier (ID14) and employee identifier (ID4) for the person who is supposed to execute this requirement. From the DS5 data.
9. Same as above except for the person who is supposed to supervise the requirement, i.e., the person who is to be notified of this requirement in order to manage its execution.

OUTPUT 03: Mock Up

10. Same as above except for the person who is supposed to approve the disposition of the requirement, if any such person has been specified.
11. Whether this requirement is mandatory (i.e., "fully completed" is the only acceptable disposition) or only recommended. From DS1 data.
12. Date that this requirement is due (for date triggered requirement (DS4 data) or for requirements for which a recommended length of time for completing the requirement has been given in the DS1 data). From DS5 data.
13. Length of time recommended to complete the requirement. From DS1 data.
14. What types of dispositions of this requirement need approval. From DS1 data.
15. OHMIS requirement identifier (ID6) for this requirement. From DS5 data.
16. OHMIS requirement type code (CT3) and description. From DS1 data.
17. Detailed description of the requirement. From DS1 data.
18. Supplemental description of the requirement. Form the DS3, DS4 or DS17 data.
18. Rationale for which this requirement was triggered. From the DS3, DS4 or DS17 data. For all allowable limits triggered requirements (i.e., those triggered from DS17 data), this includes the statement from the allowable limits applicability values data (DS16) corresponding to the allowable limits application identifier (ID20) given on the DS17 data that is referenced by the requirement application identifier (ID5) that is given on the above identified set of DS5 data. This statement explains why a particular set of allowable limits was used in the allowable limits evaluation, i.e., what allowable limit applicability characteristics the forms units had that determined which particular set of allowable limits was used.
19. The values for the requirement implementation units for this implementation of the requirement. From DS5 data.
20. The Menu Selection Sequence for the data processing steps (if any) that are involved in the execution of this requirement. From DS1 data.

OUTPUT 03: Mock Up

21. Any additional checks that should be made manually to determine if this requirement is applicable and the Menu Selection Sequence for the data processing steps (if any) involved in making these checks. From the DS3, DS4 or DS17 data.
22. Identifier of the organizational level at which this requirement applies, if it applies at a type of organizational level (CT5) other than the OHMIS service area (ID10). From the DS3, DS4 or DS17 data.
23. Description of the applicability of the requirement. From the DS1 data.
24. The values for the applicability characteristics for this implementation of the requirement. For information triggered (DS3) and allowable limits triggered (DS17) requirements only. From DS5 data.
25. Completed form identifier (ID18) for the form on which the data triggering this requirement was entered. For allowable limits triggered (DS17) requirements only. From DS5 data.
26. The values for the forms units that were used in the evaluation of allowable limits that triggered this requirement. For allowable limits triggered (DS17) requirements only. The DS17 data identifies which of the forms unit values on the completed forms data (DS14) identified by the above ID18 are the forms units that were used in the evaluation of allowable limits.
27. The values for the data element types in the forms subpart that was evaluated for allowable limits in the allowable limits evaluation that triggered this requirement, i.e., the actual data entered onto the completed forms data (DS14) for the ID18 given above that triggered the allowable limit requirement. For allowable limit requirements applicable to forms subparts (not forms-as-a-whole) only. The DS17 data identifies which form subpart was used in the allowable limits evaluation that triggered this requirement; the DS14 data for the above ID18 gives the forms specification identifier (ID16) for the forms specification data (DS10) that indicates where the forms subpart data is located; the DS14 data gives the values for this forms subpart.
28. Completed forms identifier (ID18) and values for the base line entries used in the evaluation of the allowable limits which triggered this requirement. For allowable limits triggered requirements that are applicable to forms subparts (not forms-as-a-whole) only. From the DS5 data.
29. Task identifier (ID23) for the task that was triggered to meet this requirement, if any. From the DS5 data.

### OUTPUT 03: Mock Up

30. Detailed description of the task corresponding to the above referenced task identifier (ID23). From the task type description data (DS23) and from the specific task scheduling data (DS24), if a supplemental description is provided on the DS24 data.

#### Disposition Data

Data entry spaces for completing the following disposition data. (When this data is entered onto the OHMIS data base it is stored on the requirement implementation data (DS5); once this data is entered the requirement implementation identifier data (ID9) is removed from the Outstanding Requirements List (DL3), because the entry of this data indicates that the requirement has been completed; also, any tasks that were triggered to execute this requirement (see specific task scheduling data (DS24)) are considered to have been executed upon the completion and entry of this disposition into the OHMIS data base and therefore the DS24 data for these tasks is deleted and the tasks are removed from the monthly schedule data (DS27) one week following the entry of the disposition data:

31. Date this requirement was executed.
32. Type of disposition of the requirement (i.e., fully completed, partially completed, aborted, found to be not applicable).
33. Description of what part of this requirement was implemented if the requirement was only partially implemented.
34. Description of the rationale for the disposition of the requirement, if it was not fully implemented.
35. Employee identifier (ID4) of the person who executed the requirement.
36. Explanation for why the person who actually executed the requirement was not the same as the person who was supposed to execute the requirement, if there is a difference.
37. Date that the disposition of the requirement was approved, if approval is required.
38. Employee identifier (ID4) of the person who approved the disposition of this requirement.
39. Explanation for why the person who actually approved the disposition of the requirement was not the same person who was supposed to have approved the disposition of the requirement, if there is a difference.

OUTPUT 03: Mock Up

40. Document identifiers (ID3) or completed form identifier (ID18)  
for the documents, if any, on which further information on the  
execution of this requirement is contained.

## OUTPUT 04: Description

### Outstanding Requirements List

This output lists selected data elements for the requirement implementation data (DS5) for those requirements that have not been executed, i.e., those on the outstanding requirements list (DL3). The purpose of the output is to provide the user with a Summary list of all requirements that have been triggered but which have not yet been executed. This list is generated daily to remind the user of outstanding requirements. Further information on the requirement can be obtained by the user by generating a Requirement Notification and Certification Record (O3) using the requirement implementation identifier (ID9) which is given on this output.

Data from this output is obtained by reviewing the outstanding requirements list (DL3) to identify the requirements that have not been executed and approved; referring to the requirements implementation data (DS5) for each requirement implementation identifier (ID9) on the DL3 list to identify the requirements specified by the user (or by the program for 'automatic' O4 outputs); and, abstracting the selected data elements from the DS5 data, DS1 data, and from the requirements applicability data (DS3, DS4 or DS17 data) identified in the DS5 data.

The ID9 given on the DL3 list is used to identify the appropriate DS5 data; the DS5 data is used to locate the appropriate requirement description data (DS1) used in this output, based on the requirement identifier (ID6) given in the DS5 data; the requirement application identifier (ID5) given in the DS5 data is used to locate the requirements applicability data for either information triggered requirements (DS3), date triggered requirements (DS4) or allowable limits triggered requirements (DS17) used in the output.

Generation of the Output: Most of the O4 data is obtained from the requirements implementation data (DS5). The output is generated in two ways:

- 1) 'Automatically' (see Function F1A): A series of O4 lists covering all outstanding requirements on the D13 list for the OHMIS service area is generated each day that the OHMIS Data Processing Staff person for that OHMIS service area logs onto the OHMIS system. The log on program keeps track of the last date on which the O4 list was generated and compares it with the current date each time a user with an OHMIS user identifier (ID13) that is for a OHMIS Data Processing Staff type of user (CT1) for the OHMIS service area (ID10) enters the system. The series of O4 outputs generated at this time are all for the OHMIS service area identifier (ID10) to which the Data Processing Staff person entering the OHMIS system belongs.

The series of O4 outputs automatically generated at this time includes a separate O4 listing for all of the outstanding



#### OUTPUT 04: Description

requirements for each employee identifier (ID4) who:

- o Is responsible for the execution of one or more outstanding requirements that have not been executed or approved.
- o Is responsible for supervising (managing) one or more requirements that have not been executed or approved.
- o Is responsible for approving one or more requirements that have been executed but not been approved.

These lists are then distributed by the OHMIS Data Processing Staff to the employee having the employee identifier (ID4) for which the output was generated.

- 2) Upon the request of the user using Menu Selection Sequence 1.5.2. Requests for this type of output can be for several subsets of the requirements listed on the DL3 lists, including an Outstanding Requirements List (04) for all outstanding requirements that:

- o Are for a given OHMIS service area (ID10)
- o Were triggered (i.e., the requirements implementation data (DS5) which generated) between a specified range of dates
- o Have as given requirement type code (CT3). From the DS1 data.
- o Are supposed to be executed by a given OHMIS user type (CT1) or position type (CT2). From the DS1 data.
- o Are supposed to be executed by a given OHMIS user identifier (ID13) or position identifier (ID14). The DS5 data gives the requirement application identifier (ID5) for the DS3, DS4 or DS17 data containing the ID13 or ID14.
- o Are supposed to be executed by a given employee identifier (ID4). From the DS5 data.
- o Same as the above three selection criteria except for the person who is supposed to have supervised or managed the execution of the requirement (i.e., receive notice about the requirement).
- o Same as the above three selection criteria except for the person who is supposed to approve the disposition of the requirement.

OUTPUT 04: Mock Up

TITLE: Outstanding Requirements List

1. Instructions on how to use this output.
2. Date output generated.
3. Type of person for whom this list was generated, i.e., the output should indicate for which of the following four types of persons this is a list of Outstanding Requirements: 1) The person who is supposed to execute the requirements on the list; 2) the person who is supposed to supervise or manage the execution of the requirements listed; 3) the person who is supposed to approve the disposition of the requirements listed; or, 4) none of the above. The answer is '4', if this output was generated at the request of the user, i.e., not automatically and the user did not specify that the list was supposed to be for a given type of person.
4. If the answer to the above was other than '4', the identity and mailing address of the person for whom this list was generated. The identity includes the OHMIS user type code (CT1) (or position type code (CT2)), user identifier (ID13) (or positions identifier (ID14)), employee identifier (ID4) and name. The name and mailing address is obtained from the current user/position identity and address data (DS9) corresponding to the employee identifier (ID4) given in the DS5 data.
5. OHMIS service area identifier (ID10) for which this is a list of Outstanding Requirements. This identifier can be specified by the user, when the user generates this output as a part of Menu Selection Sequence 1.5.2. If no OHMIS service area is specified, the program generates the output for the OHMIS service area to which the OHMIS user identifier (ID13) entered at the beginning of the program sequence (i.e., when 'logging on') belongs, as determined by the OHMIS user/position by service area list (DL6). For 'automatic' generations of the 04 lists (i.e., for the output generated when the OHMIS Data Processing Staff person logs on; Function F1A), the program determines the OHMIS service area based on the OHMIS user identifier (ID13) entered at the beginning of the 'log on' sequence.
6. Range of dates for which the outstanding requirements are listed, i.e., the time period during which the requirement must have been triggered (i.e., the requirements implementation data (DS5) generated) for the requirement to be listed on this output. Time period is specified by the user. In automatic outputs the range of dates is 'all'.
7. The requirement type code (CT3) of the requirements listed on this output, as specified by the user. Output would read 'all',

#### OUTPUT 04: Mock Up

if not specified or if this is an automatic generation of the 04 list.

8. The requirement identifier (ID6) for the requirements listed in this output, as specified by the user; could read 'all' if not specified or if this is an automatic output.
9. The OHMIS user type (CT1) or position type (CT2) and it's associated OHMIS user identifier (ID13) or position identifier (ID14) and/or employee identifier (ID4) of the person who is supposed to execute the requirements listed in this output. For outputs generated by the user as a part of Menu Selection Sequence 1.5.2, this code and identifier information can be specified by the user, in which case the output could be 'All'. When the output is generated 'automatically' as a part of the 'log on' program sequence, the program automatically generates separate outputs for each of the employee identifiers (ID4) for whom there are outstanding requirements at the time that the output is generated, i.e., requirements that have not been executed, or, if they have been executed, they have not been approved (as determined from the DS5 data).
10. Same as above for the person who is supposed to supervise the execution of the requirement, i.e., the management person identified as responsible for reviewing outstanding requirements and ensuring that they are completed, if any such management person was specified. Only requirements that have not been executed and not been approved are listed.
11. Same as above except: 1) It is for the person who is supposed to approve the disposition of the requirement; and, 2) The program 'automatically' generates a separate 04 output for only those outstanding requirements that require approval of the disposition of the requirement and have been executed, but have not been approved (as determined from the DS5 data).
12. Seven columns of data listing the following selected data elements for all of the specified outstanding requirements, i.e., all requirements that meet the specifications described in the above portion of this output:
  - 1) Requirement implementation identifier (ID9). From the DL3 list.
  - 2) Date that the requirement was triggered. From the DS5 data.
  - 3) Date that this requirement is due. This is for date triggered requirements only. The above date triggered is the date on which the DS5 data was generated, i.e., the date

OUTPUT 04: Mock Up

that the requirement is due minus the 'prior notification time', i.e., the 'next suspense date'. The date due given in this column of the output is the date that the requirement is due, i.e., the 'next suspense date' plus the 'prior notification time'. From the DS5 data.

- 4) Recommended length of time to complete the requirement from the date due. From the DS1 data.
- 5) Requirement identifier (ID6). From the DS5 data.
- 6) Brief description of this requirement. From the DS1 data.
- 7) Task identifier (ID23) for the task that was initiated by this requirement, if any. From the list of task identifiers (ID23) by requirement implementation identifiers (ID9) and by OHMIS service area (DL38).

## OUTPUT 05: Description

### Reminder Notice List

This output lists all reminders that have been triggered, but not executed as of the current date for a given OHMIS service area (ID10) and person responsible for executing the reminder. The output is generated from Reminder Notice type of suspense data (DS4). Reminder Notices are actions that the user wishes to be reminded of but which are not based on any requirement or recommendation, i.e., are not linked to any requirement description data (DS1). This type of suspense data is handled in the same way as requirements suspense data as far as processing, but no historical data is maintained, i.e., both the suspense data (DS4) and the requirement implementation data (DS5) are deleted as soon as the date and type of disposition of the reminder is entered into the OHMIS data base. Also, separate Notices (i.e., output 03) are not generated for each reminder item, as they are for each requirement type suspense data item; instead, the user receives a list (the Reminder Notice List (05)) which provides a description of all reminders that have been triggered (by reaching the specified suspense date) as of the current date.

Generation of Output: Most of the data on the 05 list is obtained from the requirement implementation data (DS5), using the reminder notice list (DL9) to identify those DS5 data sets that are for Reminder Notice type of suspense implementation data. The output is generated in two ways:

- 1) 'Automatically' (see Function F1A): A series of 05 lists covering all outstanding Reminder Notices in the DS5 data is generated each day that the OHMIS Data Processing Staff person logs on to the OHMIS system. Outstanding Reminder Notices are those that have been triggered, i.e., those for which Reminder Notice type of DS5 data has been generated, but which have not been executed; as only current data is maintained for Reminder Notice type implementation data, outstanding Reminder Notice data would include all DS5 data that is for Reminder Notices (as distinguished from DS5 data that is for requirements suspense data) as of the current date. The OHMIS log on program keeps track of the last date in which the 05 list was generated for an OHMIS service area and compares this date with the current date each time a user with an OHMIS user identifier (ID13) that is for a OHMIS Data Processing Staff type of user (CT1) for the service area enters the system.

The series of 05 outputs generated automatically at this time are all for the OHMIS service area (ID10) to which the Data Processing Staff user entering the system belongs. The 05 list series includes a separate 05 list of Reminder Notices for each employee identifier (ID4) who currently has one or more outstanding Reminder Notices for which he/she is responsible, i.e., for which he/she is the person whom is to

### OUTPUT 05: Description

execute the action given in the Reminder Notice. Each 05 list in this series is distributed by the Data Processing Staff to the employee having the employee identifier (ID4) for which the list was generated.

- 2) Upon the request of the user using Menu Selection Sequence 1.5.4. Requests of this type can either be a list of all Reminder Notices for an OHMIS service area (ID10) (in which case the output would be the complete series of 05 lists for the OHMIS service area); or, for all Reminder Notices for a given employee identifier (ID4) who is responsible for the execution of the action given in the Reminder Notice.

Data for the 05 output is obtained by reviewing the reminder notice list (DL9), i.e., the list identifying the requirement implementation data (DS5) for the Reminder Notice type of implementation data; identifying a requirement implementation identifier (ID9) on this list; locating the requirements implementation data (DS5) that corresponds to that ID9; and, abstracting the data elements listed on the mock up for 05. The DS5 data provides the requirement identifier (ID6) which identifies the requirement description data (DS1) used in this output; the DS5 data also provides the requirement application identifier (ID5) which identifies the appropriate date triggered requirements suspense data (DS4).

OUTPUT 05: Mock Up

TITLE: Reminder Notice List

1. Instructions to the user on how to use this output.
2. Date this output was generated.
3. The identity and address of the person who is supposed to execute the actions on this list. This includes the OHMIS user type (CT1) or position type (CT2) (from the DS1 data) and the associated OHMIS user identifier (ID13) or position identifier (ID14) (from the DS4 data) and the employee identifier (ID4) (from the DS5 data) for the person who is supposed to execute the actions listed in this Requirement Notice List (05). It also includes the name and address of this person. This information is obtained from the current user/position identity and address data (DS9) corresponding to the employee identifier (ID4) given in the DS5 data.

The user/position code and identifier information can be specified by the user, in which case, the output could read 'All', if none is specified. When the output is generated automatically as a part of the log on program sequence, the program automatically generates separate outputs for each of the employee identifiers (ID4) for whom there are outstanding reminder notices at the time that the output is generated.

4. OHMIS service area identifier (ID10) for which this is a list of outstanding Reminder Notices. This identifier can be specified by the user, when the user generates an 05 list as a part of Menu Selection Sequence 1.5.4; if no service area is specified, the program generates the output for the OHMIS service area to which the OHMIS user identifier (ID13) entered at the beginning of the program sequence belongs (as determined from the OHMIS user identifier by service area list (DL6)). For automatic generations of this output, i.e., for the output generated when the OHMIS Data Processing Staff person logs on, the program determines the OHMIS service area based on the OHMIS user identifier (ID13) entered at the beginning of the log on sequence.
5. Seven columns of data listing the following selected data elements for all of the above specified outstanding Reminder Notice actions, i.e., all those which meet the specifications given on the above portion of this output:
  - 1) Requirement implementation identifier (ID9) for this particular implementation of the action. From the DL9 list.
  - 2) Requirement application identifier (ID5) for the DS4 data that triggered this particular implementation of the action. From the DS5 data.

OUTPUT 05: Mock Up

- 3) Date this action was triggered, i.e., date that the requirement implementation data (DS5) was generated. From the DS5 data.
- 4) Date this action is due. From the DS5 data.
- 5) Supplement to the requirement description. This is the data element on the DS4 data on which the description of non-requirement actions (i.e., a description of the action that the user wishes to be reminded of by Reminder Notice type suspense data) is given.
- 6) Task identifier (ID23) for the task, if any, which was initiated by the triggering of this Reminder Notice. From the list of task identifiers (ID23) by requirement implementation identifier (ID9) and by OHMIS service area (DL38).
- 7) Spaces for entering:
  - a) The date that the action was executed.
  - b) The type of disposition of the action (fully completed, partially completed, aborted, found not applicable).

These two spaces on the output provide a means for the user to indicate that the action has been executed. These two data elements are then entered onto the requirements implementation data (DS5) using Menu Selection Sequence 1.5.3 (Function F2B) at which time the requirements implementation data (DS5) is deleted. Also, if the 'next suspense date' on the DS4 data that generated the action is greater than the 'last suspense date', then the DS4 data is deleted at this time.



## OUTPUTS 06 - 08

### Examples of User Requested Outputs

Outputs 06 through 08 consist of the Vacant Job Class List (06), the Potential New Hire List (07) and the New Hire List (08). These outputs are different from the other outputs referred to in this report, because these are not standard program management outputs or outputs that are generated automatically as a part of the execution of the core OHMIS data processing functions. Instead, these three outputs are examples of user requested outputs that are generated through a user query of specific data elements of the data base generated through OHMIS.

Although the storage and file structure of OHMIS has not been finally defined, it is conceived as a Data Base Management System type of structure. This means that the user will be able to make requests for outputs consisting of data elements specified by the user. These data elements will include most of the data elements on the OHMIS data base and the outputs will include the capability to select from a wide variety of output formats for various combinations of these data elements.

Outputs 06 through 08 are three examples of such user requested outputs. These examples were used in the discussion of the 11 core data processing functions. These outputs correspond to three Data Lists, which were also used as examples. The Data Lists are examples of temporarily generated files created at the request of the user. The three Data Lists consist of the vacant job class list (DL1) which corresponds to Output 06, the potential new hire list (DL2) which corresponds to Output 07, and the new hire list (DL4) which corresponds to Output 08. In the examples given for the use of OHMIS, it is assumed that these Data Lists may be formed by the user as a part of the process of hiring new civilian employees. Lists of this type would be used by the occupational health program activity as a work aid to facilitate the performance of functions requiring information about new employees. The lists would consist of:

- o DL1: Vacant job class list. This would be a list of job class identifiers (ID7s) for those jobs for which the Civilian Personnel Office (CPO) is actively looking for a new employee. The occupational health program activity may wish to have such a list in order to ensure that the information about the potential hazards to which employees in the job class for which new employees are being hired is current and complete. Such verification of currency of hazards data by job class would be recommended as a routine part of the inprocessing of new employees. The generation of a list such as DL1 would assist the occupational health activity managers in performing this function.

- o DL2: Potential new hire list. This would be a list of employee identifiers (ID4s) for employees that are tentatively hired, i.e., have been through most CPO processing but for whom all of the pre-employment occupational health services (e.g., preplacement physicals) have not yet been performed. The Occupational Health Nurse may wish to generate such a list as a daily checklist of persons for whom pre-employment services need to be performed.
- o DL4: New hire list. This would be a list of employee identifiers (ID4s) for employees that have recently been hired. The occupational health program activity may wish to generate such a list to use as a checklist for occupational health services needed by new employees, such as selection of and fitting for personal protective equipment, setting up routine medical surveillance, etc.

In each of the above three examples, the data from the Data Lists would be received from the CPO for the individual OHMIS Service Area on a routine (e.g., daily) basis. The Outputs (06 through 08) corresponding to these lists would consist of a "dump" of the Data Lists showing the job class of employee identifiers on the particular list as of a given date. Through a query of the data base management system in OHMIS, the user could generate such an output at any time by specifying the data elements required and the time period (date) desired. Generation of other data lists and their corresponding outputs would be done in a similar way.

It is expected that the OHMIS Users' Procedures Manual (as described in Section 6.1) will contain many examples of recommended types of special temporary data lists and user requested outputs. Although these outputs are generated at the request of the user, recommendations for appropriate user requested outputs should be included in the OHMIS Users' Procedures Manual because such outputs can act as "work aids" in the operation of the occupational health program activity. The use of such standard outputs by all installations would increase the efficiency and consistency of the Army's occupational health program operations.

### OUTPUT 09: Description

Generation of Output: Most of the 09 data is generated from the allowable limits check request data (DS18). The output is generated by the user through Menu Selection Sequence 4.4.1. Requests for this type of output can be for several subsets of allowable limits check request data (DS18), including:

- o All 09 outputs for a given OHMIS service area identifier (ID10); the ID10 is on the DS18 data. As DS18 data is only kept for outstanding allowable limits checks (i.e., those checks that have not yet been conducted), this selection criteria for this output would yield all Allowable Limits Check Notices for uncompleted allowable checks applicable to a given OHMIS service area.
- o A specific Allowable Check Notice as specified by the user using the allowable limits check request identifier (ID22) which is obtained by the program from the DS18 data and provided to the user on the Outstanding Allowable Limits Checks Needed List (O10).
- o The 09 outputs for all allowable limit check request (DS18 data) triggered between a specified range of dates. The date on which the DS18 data was generated is given on the DS18 data.

The data for the 09 output is obtained from the DS18 data for the particular allowable limits check request identifier (ID22) shown on the output mock up unless otherwise specified.

OUTPUT 09: Mock Up

TITLE: Allowable Limits Check Notice

1. Instructions to the user on how to use this output. Includes how to execute an allowable limits check (Menu Selection Sequence 4.4.4). If this is a missing allowable limits applicability values type of allowable limits check, the instructions should tell the user to have the values for the data elements listed below available when conducting the allowable limits check. These instructions are the same for all 09 outputs.
2. Allowable limits check request identifier (ID22) for this Notice.
3. Date this allowable limits check request was triggered (date the DS18 data was generated).
4. OHMIS service area identifier (ID10) from which this allowable limits check request originated.
5. Statement as to whether an allowable limits check was originated because: 1) There are missing allowable limits applicability values needed to determine which allowable limits are applicable; or, 2) the potentially applicable allowable limits identified require a manual check to determine if they match the corresponding values on the OHMIS form (i.e., the DS14 data) the entry of which initiated the allowable limits evaluation which triggered this allowable limits check request. The DS18 data indicates what type of allowable limits check request this is.
6. Whether this allowable limits check is for: 1) The form-as-a-whole; or, 2) a set of forms subpart data (DS11). (See explanation for these two types of allowable limits checks given in the descriptions prefacing the forms specification data set (DS10) and the allowable limits specification data set (DS17).)
7. The completed forms identifier (ID18) for the set of completed forms data (i.e., the entry from an OHMIS form of a set of DS14 data) the entry of which triggered this allowable limits check request.
8. The form type code (CT9) and vocabulary word describing this type of form for the above referenced ID18. The CT9 is on the DS14 data referenced by the above ID18. The vocabulary word for this type code is on the OHMIS system vocabulary words/phrase data base.
9. Forms specification identifier (ID16) for the version of the form used in the above referenced DS14 data.
10. Forms subpart identifier (ID17) for the particular part of the form, if any, covered by this allowable limits check request. If this an allowable limits check request for a form-as-a-whole, this data element would be left blank.

OUTPUT 09: Mock Up

11. The data element types and values for the up to 6 forms units (up to 9 forms units for a forms-as-a-whole allowable limits evaluation) entered onto the above referenced DS14 data. Includes an identification of which of these forms unit values are to be used in evaluating allowable limits. The forms unit values are numbered from 1 to 6 (or 1 to 9) so that the user may know which forms units are referred to in the allowable limits specification data (DS17) and/or the allowable limits applicability factors and values data (DS15 and DS16).
12. The data element types for each of the up to 5 allowable limits applicability factors for each of the up to 6 (or up to 9) forms units identified above for which the OHMIS data base was missing values at the time that the allowable limits evaluation was conducted. There would be no such data element types, if this allowable limits check request is to manually evaluate allowable limits already identified as potentially applicable.
13. The values for the up to 6 data element types entered onto the DS14 data (completed form) referenced above for the forms subpart identifier (ID17), referenced above, i.e., the values the entry of which triggered the allowable limits evaluation from which this allowable limits check request originated. If this is an allowable limits check for the form-as-a-whole, this would be blank.
14. The requirement application identifier (ID5) for the set of allowable limits specification data (DS17) found to be applicable but which requires a manual allowable limits evaluation. If this is an allowable limits check for missing allowable limits applicability values, this identifier would be left blank.
15. The description of the above referenced allowable limits specification. From the DS17 data for the above ID5. The user may use this description and the above values data entered on the DS14 data to make the manual allowable limits evaluation. If the user feels more information is needed, the 09 output provides the user with the identifiers of the form and allowable limits specifications needed to obtain further information.

## OUTPUT 010: Description

### Outstanding Allowable Limits Checks Needed Lists

This output lists selected data elements from the allowable limits check request data (DS18) for all allowable limits check requests made for a given OHMIS service area. The purpose of this output is to provide the user with a summary list of the allowable limits check requests that have been triggered by the user having entered completed forms data (DS14) of a type for which an allowable limits evaluation (part of Function F3B) could not be completed. The list is generated daily and thus acts as a check list telling the user of allowable limits checks that need to be made. Because the allowable limits check request data (DS18) is deleted when the allowable limits check (Menu Selection Sequence 4.4.4; Function F3C) is executed, there is data in the OHMIS data base for only uncompleted allowable limits checks.

Generation of Output: Most of the 010 data is obtained from the allowable limits check request data (DS18). The output is generated in two ways:

- 1) 'Automatically' (see Function F1A): the complete 010 list (i.e., covering all allowable limits check request data (DS18) for an OHMIS service area (ID10)) is generated once each day that the OHMIS Data Processing Staff person for the service area logs on to the OHMIS system. (The log on program keeps track of the last date on which the 03 list was generated and compares it with the current date each time the user with an OHMIS user identifier (ID13) that is for an OHMIS Data Processing Staff type of user (CT1) enters the system for a given OHMIS service area. The list is generated for the OHMIS service area identifier (ID10) associated with the OHMIS user logging on to the system, using the OHMIS user identifier by service area list (DL6).
- 2) Upon the request of the user using Menu Selection Sequence 4.4.2. The user may specify that this output includes:
  - o All allowable limits check request for a service area (ID10). The ID10 is on the DS18 data.
  - o All allowable limits check request generated between a specified range of dates. The date generated is on the DS18 data.
  - o All allowable limits checks for a given allowable limits specification, i.e., for a given requirement application identifier (ID5) as specified on some DS18 data sets, i.e., those DS18 data sets that are requests for manual checks of allowable limits specification already identified as applicable.

OUTPUT 010: Description

Data for this output is obtained from the allowable limits  
check request data (DS18) unless otherwise specified on the  
mock up.

OUTPUT 010: Mock Up

TITLE: Outstanding Allowable Limits Checks Needed Lists

1. Instructions to the user on how to use this output. Includes telling the user to use this summary to obtain the complete information on an allowable limits check request by generating the Allowable Limits Check Notice (09) for the allowable limits check request identifier (ID22) given on this list.
2. Date this output was generated.
3. OHMIS service area identifier (ID10) for which this is a list of allowable limits checks needed. This identifier is specified by the user; or, for automatically generated 010 outputs, determined by the program based on the OHMIS user identifier (ID13) entered at the beginning of the log on program sequence in which this output was generated.
4. Range of dates for the time period covered by the allowable limits check requests listed, i.e., the time period between which an allowable limits check request needs to have been triggered for it to be listed on this particular 09 output. Specified by the user. The output would read 'All', if not specified by the user or if this output was automatically generated.
5. Requirement application identifier (ID5) for which this constitutes a list of requirements checks needed. Specified by the user. The output would read 'All', if none specified by the user or if this is an automatically generated output.
6. Four columns of data listing the following selected data elements for all specified allowable limits check request data (DS18), i.e., all DS18 data meeting the specifications of the user:
  - 1) Allowable limits check request identifier (ID22).
  - 2) Date on which the allowable limits check request was triggered.
  - 3) Form type code (CT9) for the type of form for which data was entered which triggered this allowable limits check request. The CT9 comes from the completed forms data (DS14) for the completed forms identifier (ID18) on the DS18 data referenced by the IU22 in the corresponding first column on this output.
  - 4) The vocabulary word/phrase corresponding to the above form type code (CT9). This vocabulary data comes from a OHMIS vocabulary word/phrase data base.



## OUTPUT 011: Description

### Allowable Limits Evaluation Summary

This output is used to inform the user of the results of an evaluation for allowable limits. It is generated 'automatically' (without the user's option) on three occasions:

- 1) When the user completes the entry of completed forms data (DS14) for an OHMIS form into the OHMIS data base (Menu Selection Sequence 3.1). At the completion of the entry of data on a form the OHMIS program (Function F3B) makes an allowable limits evaluation. The 010 output summarizing the results of this evaluation is printed out following this evaluation.
- 2) The above is also true if the user is entering changes to the DS14 data, i.e., Menu Selection Sequence 3.3.
- 3) When the user completes an allowable limits check (Menu Selection Sequence 4.4.4; Function F3C).

The 010 output lists two types of information:

- 1) The allowable limits check requests, if any, that were generated as a result of the allowable limits evaluation for the form. These requests are generated when the program is not able to complete the allowable limits evaluation. (See output 09, Allowable Limits Check Notice, for explanation of allowable limits check requests.)
- 2) The requirements, if any, that were triggered as a result of the allowable limits evaluation. Requirements are triggered when the program finds that the data entered on an OHMIS form matches a set of applicable allowable limits specification data (DS17) for the data element type entered.

Generation of Output: This output is generated primarily from the completed forms data (DS14) corresponding to the completed forms identifier (ID18) from which this output was initiated; from the list of allowable limits check request identifiers (ID22) by completed form identifier (ID18) and by OHMIS service area (DL17) and the corresponding allowable limits check request data (DS18); and, from the list of active (allowable limits specification) requirement implementation identifiers (ID5) by completed form identifier (ID18) and OHMIS service area (DL18) and the corresponding requirements implementation data (DS5).

The 011 output is generated in two ways:

- 1) Automatically (as described above); and,

OUTPUT 011: Description

- 2) at the request of the user using Menu Selection Sequence 4.4.3. If the user requests this output he must specify the completed form identifier (ID18) for which he/she wishes the output generated.

OUTPUT 011: Mock Up

TITLE: Allowable Limits Evaluation Summary

1. Instructions to the user on the meaning of the data elements on this form.
2. OHMIS service area identifier (ID10) for the service area in which the form which initiated this evaluation of allowable limits originated.
3. Date this output was generated.
4. Completed form identifier (ID18) for the set of completed forms data (DS14) for which this output is a summary of the allowable limits evaluation.
5. Form type code (CT9) and vocabulary words/phrase description of the form type to which the above ID18 refers. The CT9 comes from the above referenced DS14 data. The vocabulary word/phrase description for this type code (i.e., in this case, the general title of the form) comes from the OHMIS vocabulary word/phrase data base.
6. Date the above referenced DS14 data was completed. From the DS14 data.
7. Values for the up to 9 forms units on the above referenced completed form, i.e., on the DS14 data.
8. Subinstructions telling the user that the following are the allowable limits check request identifiers, if any, for the allowable limits checks that still remain unexecuted for the data entered on the above form.
9. A listing of each of the allowable limits check request identifiers (ID22) on the list of allowable limits check request identifiers by completed form identifier and by OHMIS service area (DL17) that are for the above referenced completed form identifier (ID18).
10. Subinstructions telling the user that the following are:
  - 1) The requirement implementation identifier (ID9) for the requirements that were triggered by a finding during the allowable limits evaluation that allowable limits had been met, if the requirement has not yet been executed;
  - 2) the identifier for the requirement triggered; and,
  - 3) the identifier for the allowable limits specification data which was found to match.

OUTPUT 011: Mock Up

This subinstruction tells the user that there may have been no requirements triggered by this allowable limits evaluation (or that they have already been executed) and that, in that case, no identifiers will be listed below.

11. Three columns of data listing:

- 1) Requirement implementation identifier (ID9). From the DL18 for the above referenced completed form identifier (ID18).
- 2) Requirement identifier (ID6) for the requirement listed on the requirement implementation data (DS5) for the ID9 given in the first column.
- 3) (Allowable limits specification) requirement application identifier (ID5) for the set of allowable limits specification data (DS17) which was found to match the data entered on the above referenced form and therefore resulted in the triggering of a requirement. From the DS5 data referenced by the above ID9.

## OUTPUT 012: Description

### OHMIS 'Blank' Form (Generic)

This description and mock up of an output is provided to show the generic format that will be used for all OHMIS 'blank' forms. It corresponds to the completed forms data (DS14) which provides a description of the generic data set that is used to enter data from all OHMIS forms. OHMIS will have many different forms and is designed to allow the user to add new forms at any time. Some of the expected major types of forms that will be used in OHMIS are described in the Form Type (FT) description section of this report. Each type of blank form will, of course, look different from all other forms, depending on its content (i.e., the data elements requested on the form). However, all forms will have a common data input format (shown in DS14) and a common data output format, shown here.

Generation of Output: This output is generated primarily from the forms description data (DS10) which describes the contents of a form. The DS10 data specifies the individual data element types on the form by reference to sets of forms subpart data (DS11) and therefore DS11 data is also used extensively in this output. Some of the data element types in the identification portion of a blank form are completed by the user at the time that the blank form is generated (Function F3A). This data is stored on the outstanding (uncompleted) forms monitoring data (DS22) for the form until data from the form has been entered onto the OHMIS data base.

An 012 output is generated during Function F3A (generation of blank forms function). The user may specify that he/she wishes only to examine a blank form, i.e., examine forms description data (Menu Selection Sequence 2.1.4); or, the user may wish to generate a form for the purposes of entering data onto the form (Menu Selection Sequence 2.1.5). If the former, the 012 output is completely blank (except for the completed form identifier (ID18)) and contains only information on the DS10 and DS11 data (i.e., not the DS22 data). If the latter, the user is asked to supply some of the identification portions of the data on the form at the time that the form is generated; this data is stored on the DS22 data and is called on in the 012 output generated at the end of Function F3A.

The user may also request a copy of a form that has already been previously generated, i.e., a form for which he/she has already provided the identification information (Menu Selection Sequence 2.1.5). The 012 output with the completed identification information is also portrayed on the data entry screen when the user indicates that he/she is ready to enter data for this form (Menu Selection Sequence 3.1; Function F3B).

The 012 format is also used to provide the description and mock up of the output that would be generated when a user requested an output of an already fully completed form (Menu Selection Sequences 3.2, 3.3, 3.4, and 3.5). For these outputs there is no corresponding DS22 data and

## OUTPUT 012: Description

therefore the data elements from the DS22 data are blank. The data for the 012 outputs of fully completed forms is derived from the DS14 data for that form by specifying the completed forms identifier (ID18) for the form which the user wishes to generate. For Missing Data Element Type Forms (i.e., forms generated by the program to collect data missing from the OHMIS data base) it is not possible to regenerate the 012 output once the form has been completed, because the contents of the form are not maintained; once entered, the missing data is stored in the location where the data element types would have been stored had the data not been missing and the format and contents of the Missing Data Element Type Form (which was stored on the DS22 data) is deleted.

When generating an 012 output, the user may specify that he/she wishes:

- o A particular previously generated form, by providing the completed form identifier (ID18) for that form;
- o a particular version of a form type, by providing the forms specification identifier (ID16) for that version of the form;
- o the default version of a particular form type by providing the form type code (CT9) for the type of form desired;
- o the applicable version of a form of a given type, by providing the values for the factors that determine which version of that form type is applicable.

OUTPUT 012: Mock Up

TITLE: OHMIS 'Blank' Form (Generic)

1. Title of this type of form. Obtained from the OHMIS vocabulary word/phrase list for the form type code (CT9) for this type of form.
2. Supplemental title for this version of the form, if any. From the DS10 data.
3. General instructions for the use of the form. From the DS10 data.
4. Statement indicating whether or not this is a Missing Data Element Type Form, i.e., a form generated by the OHMIS program to collect information that is missing on a given identifier (e.g., employee, facility, etc.).

Identification Data

5. Form type code (CT9). There will be a standard form type code for Missing Data Element Type Forms; otherwise this is specified by the user.
6. Forms specification identifier (ID16) for this version of the form. There is no ID16 for Missing Data Element Type Forms. For other forms the ID16 is either specified by the user or is determined by the program during Function F3A based on the type of form (CT9) and the match between the forms applicability values data (DS13) and the values given by the user.
7. Completed form identifier (ID18). This is a unique value assigned by the program to each new output of an OHMIS form. It distinguishes one set of completed forms data (DS14) entered on an OHMIS form from all other sets of data entered on the same type and version of the form. If the user is requesting an 012 output for a previously generated form, he/she specifies the ID18 to identify the form desired.
8. Date this form generated. Identified by the OHMIS Function F3A program at the first time that the form is generated. From the DS22 data for previously generated forms.
9. Time from the above date that this completed form is due to the person requesting the data (specified below). This is calculated from data given in the DS10 data that corresponds to the above ID16, if the DS10 data specifies any time; otherwise, it is specified by the user and stored on the DS22 data.
10. OHMIS service area identifier (ID10) out of which this form specification was generated. From the DS10 data for first-time forms; from the DS22 data for previously generated forms; same as

OUTPUT 012: Mock Up

the ID10 on the originating form for the Missing Data Element Type Forms (where 'originating form' means the form that was being generated by the user which triggered the generation of the Missing Data Element Type Form).

11. The OHMIS user identifier (ID13) or OHMIS position identifier (ID14) of the person who is supposed to complete this form. Maybe an employee identifier (ID4), if person is not an OHMIS user or does not fill and OHMIS position. For first-time forms this may be specified by the user. If it is not, the program examines the DS10 data for the type of OHMIS user (CT1) or type of OHMIS position (CT2) for the person who is supposed to complete this form. If the DS10 data does not specify a CT1 or CT2 code, this is left blank. For Missing Data Element Type Forms the person who is supposed to complete the form is the same as the person who is to complete the originating form. If the 012 is generated only for examination purposes, i.e., in Menu Selection Sequence 2.1.4 and not for use in entering data, this part of the output is left blank.
12. Employee identifier (ID4) for the above person if known. From the current user/position identity and address data (DS9).
13. Address for the above person. From the DS9 data.
14. OHMIS user identifier (ID13) or position identifier (ID14) (or employee identifier (ID4) if there is no OHMIS user/position) for the person, if any and if known, who is supposed to review ('sign off on') the completed form. For first time forms this is from the CT1 or CT2 specified in the DS10 data, if any specified. The CT1 or CT2 is converted into an ID13 or ID14 using the OHMIS user/position identifier by OHMIS user/position type list (DL8). If not specified on the DS10, this part of the output is left blank unless the user generating the form specified a reviewer. The user generating the form may also specify a person other than the person specified on the DS10 data. For previously generated forms, this information is from the DS22 data. It is left blank on forms generated for the purpose of examination only (Menu Selection Sequence 2.1.4).
15. Employee identifier (ID4) for the above person.
16. Address of the above person. From the DS9 data.
17. OHMIS user identifier (ID13) for the person requesting the data. For first time forms this information is determined by the OHMIS program from the identity of the person logging on to the OHMIS program to generate the form; or, the user may specify a different requestor. From the DS22 data for previously generated forms. Same as the originating form for Missing Data Element Type Forms. Left blank on forms generated for examination only.



#### OUTPUT 012: Mock Up

18. Employee identifier (ID4) for the above person. From DS9 data.
19. Address of the above person with a statement indicating that this is the address to which the completed form is to be returned.
20. Data element type description and spaces for entering the date that the data on the completed forms was obtained.
21. Statement indicating how long after the above date the hard copy of this form is to be maintained. From the DS10 data; if '0' on the DS10 data no statement at all is put on the output. Left off of the output for Missing Data Element Type Forms.
22. Data element type description and space for entering the employee identifier (ID4) for the person who actually did complete this form.
23. Data element type description and space for entering the employee identifier (ID4) for the person who actually did review ('sign off on') the completed form, if any.
24. Data element type description and space for entering date that the form was reviewed.
25. Up to 9 form unit identifiers for this form, i.e., the unit (e.g., an employee identifier (ID4)) or set of units for which this form provides data. These may have already been completed (if the user provided this information when generating the form) in which case both the data element type description and the value for the identifier(s) that were entered by the user would be printed out on the output; or they may be left blank (i.e., the user did not know the identity of the unit for which this form was to be used at the time that the form was generated) in which case only the data element type description and space for entering the form unit identifiers would be provided on the 012 output. For example, the form might say 'Name of Employee:'. If no form unit identifier information is provided by the user when generating the form, then a set of DS22 data is not generated. For previously generated forms, the forms unit identifier information is obtained from the DS22 data for the form. For Missing Data Element Type Forms, there is only one form unit identifier and this is the identifier for the unit about which the Missing Data Element Type Form is providing for the collection of missing information.

#### Content of Form

26. For Missing Data Element Type Forms, the content of the 012 output consists of a series of up to 20 data element type descriptions and spaces for entering the values for these data element types. The missing data element types are identified by the program at the

OUTPUT 012: Mock Up

time that the originating form is generated by the user. To do this, the program examines each of the forms unit identifiers provided by the user when generating the form and uses the missing data element list (DL25) to determine if there are any missing data element types for the form unit. The missing data element type information identifier(s) (ID21) for this unit are entered onto the DS22 data. When printing the 012 output, there are up to 20 pairs of the following information: The data element type description and space for entering the value for the data element type.

27. For other forms, the contents of the form consists of the data element type description and spaces for entering values for the data element types in the forms subpart data sets (DS11) specified on the DS10 data corresponding to the forms specification identifier (ID16) for the form. Specifically, the contents consist of the following sets of information for each forms subpart:
  - o The subtitle of the form subpart (if any).
  - o The instructions for the form subpart (if any).
  - o The data element type description and space for entering the information for each of the up to 6 data element types in this forms subpart.
28. A statement asking the user to identify those data element types which the user wishes to have considered as 'secondary base line data'. As explained in the DS14 data, a secondary base line value is a value other than the original base line value that the user wishes to be treated as though it were the base line value. This statement is omitted from Missing Data Element Type Forms and forms for which the DS10 data indicates that there are no data element types on the form that can have base line entries for the data element type.

## OUTPUT 013: Description

### Outstanding Data Requests List

This output lists selected data elements for the outstanding (uncompleted) forms monitoring data (DS22) for those OHMIS forms that have been generated and sent for completion, but which have not yet been completed and returned to OHMIS. The purpose of the output is to enable the OHMIS Data Processing Staff person to monitor what forms have not been received and to send out a new request for the data, if needed. Further information on the type of data requested can be obtained by generating the blank form (Output 012) again (Function F3A; asking for a previously generated form) for the completed form identifier (ID18) given on this output.

Generation of Output: Most of the 013 data is obtained from the DS22 data. Some data comes from the forms specification data (DS10) and the name on the 013 list comes from the current user/position identity and address data (DS9).

The output is generated in two ways:

- 1) 'Automatically' (see Function F1A): An 013 list for an OHMIS service area (ID10) is generated each day that the OHMIS Data Processing Staff for that OHMIS service area logs on to the OHMIS system. The log on program keeps track of the last date on which the 013 list was generated and compares the current date each time a user with a OHMIS user identifier (ID13) that is for an OHMIS Data Processing Staff type of user (CT1) for the OHMIS service area (ID10) enters the system. The automatically generated 013 includes a list of only those outstanding (uncompleted) forms that are over due (as determined from the list of over due data requests by the OHMIS service area (DL28)) or forms that do not have a due date (as determined from the list of outstanding data requests (no due date specified) by OHMIS service area (DL27)).
- 2) Upon the request of the user using Menu Selection Sequence 3.7. Requests may be for:
  - o All over due data requests for an OHMIS service area, i.e., all OHMIS forms that have not been received that were due to be received before the current date. This output is generated using the over due data requests by OHMIS service area (DL28).
  - o All outstanding data requests for an OHMIS service area, i.e., all forms that have not been received, even those that are not yet due. This output would be generated using DL28 and the list of new outstanding data requests (not over due) by OHMIS service area (DL26); and, the list of outstanding data requests (no due date specified) by OHMIS service area (DL27).

### OUTPUT 013: Description

Each 013 list is printed with all outstanding requests from a given person (i.e., all outstanding forms that are supposed to be completed by a given person) grouped together and in order of due date (if one was given) for multiple forms due from the same person. The user can specify a 013 output for a given person from whom the data has been requested. The user can also specify an 013 output for all those requests made by a given person.

OUTPUT 013: Mock Up

TITLE: Outstanding Data Requests Lists

1. Instructions on how to use this output.
2. Date this output generated.
3. OHMIS service area identifier (ID10) for which this output was generated. This identifier can either be specified by the user when requesting the generation of the output (Menu Selection Sequence 3.7). If no OHMIS service area is specified, the program generates the output for the service area to which the OHMIS user identifier (ID13) entered at the beginning of the program sequence (when 'logging on') belongs, as determined by the OHMIS user/position by service area list (DL6). For automatic generations of the 013 lists (i.e., outputs generated when the OHMIS Data Processing Staff 'logs on' once a day; Function F1A), the program determines the OHMIS service area from the ID13 at the beginning of the log on sequence.
4. Subinstructions telling the user that the following is the forms monitoring data for: 1) The forms that are over due; 2) the forms that have no due date; or, 3) all outstanding forms.
5. Seven columns of information giving the following selected data element types:
  - 1) Completed form identifier (ID18). This identifier is obtained from the DL28 (over due), DL27 (no due date) or from the DL26 (new data requests), DL27 and DL28 lists, i.e., the lists covering all outstanding forms.
  - 2) The form title and supplemental form title. The form title is obtained from the OHMIS vocabulary word/phrase that corresponds to the form type code (CT9) that is on the DS22 data that corresponds to the above ID18. The supplemental form title (if any) is the title of a particular version of the form. It is given on the DS10 data that corresponds to the forms specification identifier (ID16) that is on the DS22 data for the above ID18.
  - 3) Forms unit identifier (up to 9). From the DS22 data.
  - 4) Date this form generated. From the DS22 data.
  - 5) Date this form due. Calculated by adding the length of time to complete the form before it is over due (given on the DS22 data) to the date that the form was generated. Leave blank, if no length of time has been specified.

OUTPUT 013: Mock Up

- 6) Person (employee identifier (ID4), OHMIS user or OHMIS position identifier (ID13/ID14) and name) from whom the data is requested. From the DS22 data.
- 7) Person (ID4; ID13 or ID14; and name) who requested this data, if known. From the DS22 data.

## OUTPUT 014: Description

### Daily Schedule

This output provides a listing of the tasks that have been scheduled for each OHMIS user (and some OHMIS positions) in an OHMIS service area. The purpose of the output is to inform each user who has been scheduled for tasks of the actions that have been scheduled for that user on a given day.

Generation of Output: Most of the 014 data is obtained from the monthly schedule data (DS27) for each OHMIS user/position which contains the date and time that each task has been scheduled for the month. the data describing the tasks on the schedule come from the specific task scheduling data (DS24) corresponding to each of the task identifiers (ID23) that are on the DS27 data. Other data on the task comes from the task type description data (DS23) corresponding to the task type code (CT8) on the DS24 data for the task.

The output is generated in two ways:

- 1) 'Automatically' (see Function F1A): An 014 is generated for each OHMIS user (ID13) and each OHMIS position (ID14) in an OHMIS service area (ID10) for which there is current regular weekly schedule availability data (DS26). This output is generated once each day that the OHMIS Data Processing Staff for the OHMIS service area logs on to the OHMIS system.

The automatic 014 output consists of a separate Daily Schedule for each user/position in the OHMIS service area for the day that the output is generated, based on the monthly schedule data (DS27) covering that user/position and that day. It is envisioned that the OHMIS Data Processing Staff for an OHMIS service area will generate the Daily Schedule early in the day and distribute it to each OHMIS user/position for use during the day.

- 2) Upon the request of the user using Menu Selection Sequence 7.3.4. Requests may be for:

- o Daily Schedule for a given date for all user/positions. The scheduling program keeps old schedules for one week after the end of the month covered by the monthly schedule data (DS27). There will be in existence at all times monthly schedule data (DS27) for at least one month in advance of the current date, as once a month the OHMIS program (Function F1A) generates a monthly schedule for two months in advance for all OHMIS user/positions for which there is regular weekly schedule data (DS26). There may also be schedules for many additional months in advance, if the user has provided scheduling information for them. The user may request an 014 for any date and

#### OUTPUT 014: Description

the program will check the DS27 to determine if the scheduling data currently exists and inform the user, if not.

- o Daily Schedule for a given OHMIS user or position (ID13/ID14) for a given date. The OHMIS program will check the list of monthly schedule identifiers by OHMIS service area (DL33) to determine if there is a schedule for the user/position specified and inform the user requesting the Daily Schedule.

The monthly schedule data (DS27) from which output 014 comes provides scheduling data on an individual OHMIS user/position for an entire month. The DS27 data includes both information on the time that the user has available for scheduling and the actual task that have been scheduled to fill this time (if any). The output 014 is for only one date on the DS27 data and lists the information about each time slot (each quarter of an hour period) in that day which has been identified as being available for scheduling. That is, the output does give an indication of unscheduled time periods as well as scheduled time periods.

Unless otherwise indicated, each data element on the following mock up for 014 is from the DS27 data for the user/position and covering the date of interest.



OUTPUT 014: Mock Up

TITLE: Daily Schedule

1. Instructions on how to use this output.
2. Date this output was generated.
3. Date for which this output is a Daily Schedule.
4. OHMIS service area identifier (ID10) for which the output was generated.
5. OHMIS user identifier (ID13) or OHMIS position identifier (ID14) for the user/position for which this output constitutes a Daily Schedule.
6. Name and 'address' (for distribution) of the above person. From the current user/position identity and address data (DS9) corresponding to the above ID13/ID14.
7. Beginning with the earliest time slot (hour and quarter hour in the day) for which the DS27 data indicates that the user/position has hours available for scheduling, provide the following two columns of data:
  - 1) The hour of the day (1 through 24).
  - 2) The quarter of an hour time slot for the above hour (1 through 4).

Adjacent to these two columns of data provide the following additional ten columns of data for each time slot available for scheduling whenever the data is different for the same type of data for the previous time slot. For example, if the user's preferred time use code was the same for the first twelve time slots (the first three hours) it would only be listed once on the first time slot and then left blank until a time slot was reached in which the preferred time use was different. (This listing of information only when it changes is done to make it easier to read the Daily Schedule at a glance):

- 3) Preferred time use code (CT11) and meaning of code. Meaning of code is from the OHMIS vocabulary word/phrase data base.

(The following data elements are included on the output only if the time slot has been scheduled.)

- 4) Task identifier (ID23) for the task scheduled during this time slot.

OUTPUT 014: Mock Up

- 5) Brief task description of the task. From the task type description data (DS23) corresponding to the task type code on specific task scheduling data (DS24) corresponding to the ID23 listed above.
- 6) Estimated number of time slots (quarter of an hour periods) required to complete this task. From the DS24 data.
- 7) Date this task was triggered. From the DS24 data. This information will tell the user how long the task has been outstanding. If it is an undated (no due date) task or if there is a long cue for scheduling tasks in this OHMIS service area it is possible that the task may have been scheduled for a very long time since it was triggered.
- 8) Date task due, if any. This is from the DS24 data and applies only to dated tasks.
- 9) Facility identifier (ID8) for the main location in which this task is to be conducted, if known. From the DS24 data.
- 10) Requirement implementation identifier (ID9) for the requirement (recommendation) that triggered this task. Putting this information on the Daily Schedule will make it easier for the user to enter requirement disposition data, i.e., data indicating that the requirement has been executed (Menu Selection Sequence 1.5.3; Function F2B). It will also be the case that the completion of a task on the Daily Schedule will mean the execution of a requirement and is likely that the user will wish to enter the requirement disposition data on the requirement immediately following the completion of the task on the Daily Schedule.
- 11) The amount of time needed to complete this task, if it was not possible to complete the task during the amount of time scheduled for the task. This information would be entered by the user onto the specific task scheduling data (DS24) for the task so that the OHMIS rescheduling program (Function F4B) could use this information when rescheduling the task.
- 12) Space for the user to write in comments about the task, e.g., to check if the task has been completed, to make notes on the need for rescheduling, etc.

## OUTPUT 015: Description

### Scheduling Notice

This output is simply a notice to the person affected that they have been scheduled to participate in a given task. The most frequent use of this notice will be to notify employees that they have been scheduled for routine medical examinations, follow-up tests, pre-employment physicals, etc.

Generation of Output: Most of the data on this output comes from the specific task scheduling data (DS24) for the task for which this output constitutes a notice. Some of the data comes from the facility data by task type data (DS25) and the task type description data (DS23) corresponding to the task type code (CT8) given on the DS24 data.

This output is generated in two ways:

- 1) 'Automatically' (see Function F4A): A 015 Notice is generated at the time that the task is scheduled, if the task type description data (DS23) on the task indicates that a Scheduling Notice is to be generated. The Scheduling Notice is sent to the person(s) identified (generically) on the DS23 data. This output is generated once when the task is scheduled, each time the task is rescheduled and once two weeks before the task is scheduled.
- 2) Upon the request of the user, using Menu Selection Sequence 7.3.5. These Scheduling Notices are sent to the person specified by the user as a part of the request made for the Scheduling Notice.

OUTPUT 015: Mock Up

TITLE: Scheduling Notice

1. Instructions (explanation) about how to use this output.
2. Date this output was generated.
3. Task identifier (ID23) for this task. Identifies the specific task scheduling data (DS24) for the task covered by this Scheduling Notice.
4. Employee identifier (ID4) of the person to whom this notice is to be sent. The ID4 is obtained in one of the following ways:
  - o It is provided by the user at the time that the request for the Scheduling Notice is made (Menu Selection Sequence 7.3.5).
  - o It is obtained from the requirement implementation data (DS5) for the requirement that triggered this task. The DS5 data is referenced by the ID9 given on the DS24 data corresponding to the above ID23. The program uses the task type description data (DS23), identified by the task type code (CT8) on the DS24 data corresponding to the above ID23 to determine generically what type of employee is to be notified. It then uses the DS5 data to either identify the requirement implementation unit(s) for the task. Depending on the generic person identified on the DS23 data, either the employee identifier (ID4) that is one of the requirement implementation unit(s) is the person that is to be notified; or,, the contact and location data (DS28) corresponding to one of the requirement implementation units identifies the person to be notified.
5. 'Address' data for the above employee. From the contact and location data (DS28) for the employee or other requirement implementation unit for the task.
6. Description of the task used for scheduling. From the DS23 data.
7. Time slot for the task, i.e., the date, hour and minute the task is to begin. Also, the time slot that the task is scheduled to end. From the DS24 data.
8. Description and address of the location to which the above person is to report for the task. This includes the following data elements all of which are obtained from the facility data by task type (DS25) corresponding to the task type code (CT8) and OHMIS service area identifier (ID10) on the DS24 data corresponding to the above ID23:

OUTPUT 015: Mock Up

- a) Facility type code (CT7) and description of the facility type given on the OHMIS vocabulary word/phrase data base for this code. May be left blank if no such CT7 was given on the DS25 data.
  - b) Generic description of the facility to which the employee is to report, e.g., "to the place where you report for work"; this description comes from the DS25 data and is used if no CT7 is given on the DS25 data.
  - c) Facility identifier (ID8) for the facility. Left blank if not given on the DS25 data.
  - d) Address of the facility, including the specific room (if applicable) to which the employee is to report.
  - e) Additional information about the facility, if any, e.g., directions, passes needed, etc.
9. Special instructions to the employee on how to prepare for this task, e.g., not to eat breakfast that day, etc. From the DS23 data and/or DS24 data.
10. Requests from the employee receiving this 015 output to verify receipt and confirm the acceptability of the scheduling time. This could be a tear off portion of the Scheduling Notice or a second page of the Scheduling Notice or it could be printed on NCR type paper or some other method of providing a return of the Notice from the employee receiving it. The person receiving the Scheduling Notice would indicate:
- o Whether or not he/she is able to meet the schedule given above;
  - o if not, preferred date and time; and,
  - o any explanation of scheduling restrictions, i.e. information about other times that the employee will not be able to participate in the task.

This portion of the Scheduling Notice will be returned to the OHMIS Data Processing Staff person for use in rescheduling the task in which the employee will participate, if necessary. The information on restrictions provided on the Notice, if any, will be added to either the special restrictions data on the DS24 data or to the standard restrictions on the DS28 (and corresponding DS26) data, depending whether the employee indicates that the restriction is an ongoing one (e.g., works swing shift), i.e., a standard restriction; or, a one-time one (e.g., annual leave time), i.e., a special restriction.

## OUTPUT 016: Description

### Scheduled/Not Scheduled Task Description

This output is used to provide the OHMIS user/position with a detailed description of a task that has been scheduled to enable the user to more easily determine what is involved in executing the task. It is expected that the user will note that a task is scheduled on the Daily Schedule (output 014) and then refer to the 016 output for the details about the task.

Generation of Output: Unless otherwise specified, the data on this output comes from the specific task scheduling data (DS24) for the task which is covered by this output. Some of the data comes from the task type description data (DS23) corresponding to the type of task for which this output was generated as determined by the task type code (CT8) on the DS24 data. One set of data elements comes from the monthly schedule data set(s) (DS27) on which this task is scheduled. Also, the list of qualified employee identifiers (ID4) by task type (CT8) and by OHMIS service area (DL34) is used.

This output is generated in two ways:

- 1) 'Automatically' (see Function F1A): The 016 is generated once each day that an OHMIS Data Processing Staff person for the OHMIS service area logs on to the OHMIS system, for each of those tasks that are listed on the Daily Schedule (014) generated at that time, i.e., for that day. The identification of these tasks is obtained from the monthly schedule data (DS27) for the OHMIS service area.
- 2) Upon the request of the user using Menu Selection Sequence 7.4.3. The user requests the 016 for a given task identifier (ID23).

OUTPUT 016: Mock Up

TITLE: Scheduled/Not Scheduled Task Description

1. Instructions on how to use this output, including a statement on whether this 016 is: 1) The first Scheduling Notice for the task; 2) a Notice that was generated as a result of rescheduling the task; or 3) the 'automatic' resending of the Notice that is done two weeks prior to the date that the task is scheduled.
2. Date this output was generated.
3. Task identifier (ID23) for the task being described in this output.
4. OHMIS service area identifier (ID10) for the area in which this task originates.
5. Task type code (CT8) for this task.
6. Detailed description of the task. From the DS23 data.
7. Supplement to the detailed description of the task.
8. Time use code (CT11) for the task.
9. Requirement implementation unit identifier(s) for the task.
11. Date task was triggered, i.e., date DS24 data for this task was generated.
12. Date this task is due, for dated tasks.
13. Whether or not it was possible to schedule this task and if not why, i.e., the code 'A' through 'D' for why not. (Some of the following data elements will be left blank if the answer was 'no'.)
14. Time slot (date and hour) this task is scheduled to begin. Also the monthly schedule identifier (ID27) for the monthly schedule data (DS27) on which this task is scheduled to begin.
15. Estimated number of time slots (quarter of an hour periods) required to perform this task. This is equal to the user specified number of time slots required to perform the task plus the number of interruptions in the scheduling of the task. This is listed on the DS24 data as the actual number of time slots required for scheduling the task.
16. Time slot (date and hour) at which this task is scheduled to be completed. Also ID27.

OUTPUT 016: Mock Up

17. Each of the time slots for which this task is scheduled. From the DS27 data. By knowing the start time slot (from the DS24 data) each successive time slot in which the task is scheduled can be determined.
18. Whether or not there are any interruptions in the task as it is currently scheduled, i.e., breaks for lunch, other tasks, etc.
19. Employee identifier (ID4) for the primary person who is to perform this task.
20. OHMIS user identifier (ID13) or position identifier (ID14) and description of the above person. From the current user/position identity and address data (DS9).
21. Employee identifier (ID4), the corresponding user/position identifiers (ID13/ID14) and the monthly schedule identifiers (ID27) for the start and end time slots for the up to 3 other persons, if any, who will also be performing this task.
22. Description and address of the location in which this task is to take place. This is the same as the information given on the Scheduling Notice (015). Comes from the facility identifier (ID8) given on the DS24 data and the facility data by task type (DS25) if there is DS25 data for this task type (CT8) and if the ID8 given on this DS25 data is the same as the ID8 on the DS24 data. Otherwise only the ID8 is provided. May be blank, if the location could not be determined as of the date of this output.
23. Whether or not this is an 'employee transport' type of task.
24. Problems with scheduling this task, i.e., an indication of whether it was not possible to schedule this task during the preferred time use and whether it was not possible to schedule this task to be completed by the due date. This information about the problems of scheduling the requirement will be used by the users to evaluate scheduling problems and make changes in the schedule availability data in the future.
25. Description of the preparation required to perform this task. From the DS23 and the DS24 data.
26. Requirement implementation identifier (ID9) for the requirement implementation data (DS5) that initiated this task.
27. Requirement identifier (ID6) for the requirement that triggered this task. From the DS5 data for the above referenced ID9.



OUTPUT 016: Mock Up

28. Brief description of the requirement that triggered this task, if any. From the requirement description data (DS1) for the above referenced ID6.
29. Whether this is a Reminder Notice (low priority) type task, i.e., whether this task was triggered by Reminder Notice type suspense data (DS4). If the answer is Yes, there will be no ID6 or brief description of the requirement given above.
30. Whether this task is triggered by a mandatory or recommended requirement. This information would be left blank if this is a Reminder Notice type of task.
31. Description of the qualifications for performing this task. From the DS23 data.
32. Employee identifier (ID4) and corresponding user/position identifiers (ID13/ID14) for all persons qualified to perform this task in this OHMIS service area. From the list of qualified employee identifiers by task type and by OHMIS service area (DL34).

## OUTPUT 017: Description

### List of Unscheduled Tasks

This output provides a list of the tasks that were triggered (i.e., for which a set of requirements implementation data (DS5) for a requirement involving the completion of the task was generated, because this requirement was found to be applicable), but for which the OHMIS automatic scheduling program (Function F4A) could not schedule a time slot for the task. As explained in the specific task scheduling data (DS24) the only reason why it would not be possible to automatically schedule a task at the time that the task was triggered is because there were no persons qualified to perform the task in the OHMIS service area in which the task originated (as shown by the list of qualified employee identifiers (ID4) by task type (CT8) by OHMIS service area (DL34)) or there was no regular weekly schedule availability data (DS26) on the qualified persons in the service area. This output is used to inform the OHMIS Data Processing Staff person for the OHMIS service area that a task cannot be scheduled automatically, so that corrections to the qualified employee list (DL31) and/or to the schedule availability data (DS26 or DS27) can be made.

Generation of Output: The data for 017 comes primarily from the list of task identifiers (ID23) for tasks that cannot be scheduled by OHMIS service area (DL31).

This output is generated in two ways:

- 1) 'Automatically' (Function F1A): A 017 output is generated for each OHMIS service area (ID10) once each day that the OHMIS Data Processing Staff person for the service area logs on to the OHMIS system. At that time the OHMIS program (Function F1A) examines each task identifier on the list of task identifiers (ID23) for tasks that cannot be scheduled by OHMIS service area (DL31) and attempts to schedule them (Function F4A). If they can be scheduled, they are removed from the DS31 list; otherwise, they remain on the list and are used in the 017 output for the day.
- 2) Upon the request of the user, using Menu Selection Sequence 7.3.7. The user specifies the OHMIS service area (ID10) for which he/she wishes a current 017 output.

OUTPUT 017: Mock Up

TITLE: List of Unscheduled Tasks

1. Instructions on how to use this output.
2. Date this output was generated.
3. OHMIS service area identifier (ID10) for which this output was generated.
4. Four columns of data containing the following selected data elements:
  - 1) Task identifier (ID23) for one of the tasks that cannot be scheduled.
  - 2) Task type code (CT8) for the task. From the DS24 data corresponding to the above ID23.
  - 3) The brief description of the task. From the task type description data (DS23) for the task type code (CT8) given above.
  - 4) Explanation of why the task could not be scheduled. From the DS24 data.

## 6.8 FUNCTIONAL DATA FLOWS

The following are the Functional Data Flows describing the Inputs/Processing/Outputs of the core OHMIS data processing functions. These Data Flows provide the programming logic for the recommended system design for OHMIS given in FIGURE 5-2.

TITLES OF OHMIS CORE DATA PROCESSING FUNCTIONS

FUNCTION F1: User Transparent Functions

Function F1A: 'Log-on' Transparent Function

Function F1B: Triggering Step Transparent Function

FUNCTION F2: Requirements Functions

Function F2A: Requirements Check Function

Function F2B: Function for Entering Requirements Disposition Data

FUNCTION F3: OHMIS Forms Data Processing Functions

Function F3A: Generation of (Blank) Forms Functions

Function F3B: Completed Forms Data Entry and Allowable Limits Evaluation Function

Function F3C: Allowable Limits Check Function

Function F3D: Function for Canceling the Monitoring of Outstanding (uncompleted) OHMIS Forms

FUNCTION F4: Scheduling Functions

Function F4A: Scheduling Function

Function F4B: Rescheduling Function

Function F4C: Function for Routine Generation of Tentative Monthly Schedule Availability Data

## FUNCTIONAL DATA FLOWS

### FOR 'F1' FUNCTIONS: Transparent Functions

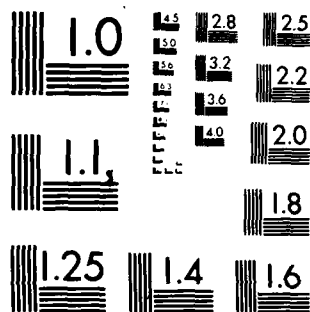
This is a series of functions performed by the OHMIS program that is transparent to the user. The user executes a particular OHMIS step and this results in a data processing function internal to the OHMIS program, i.e., a function not performed at the discretion of the user. Only the less conventional transparent functions (those peculiar to the OHMIS core data processing program) are described here. The conventional transparent functions such as checking passwords and conducting edit checks of data entries are not described unless the standard applications of these conventional methods have been modified for the OHMIS program.

RECOMMENDED SYSTEM DESIGN FOR THE OCCUPATIONAL HEALTH  
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## FUNCTION F1A

### 'Log On' Transparent Function

#### (Functional Data Flow)

This functional data flow describes the transparent functions which occur 'automatically' each time that a user logs on to the OHMIS system.

#### SUMMARY OF SUBFUNCTIONS:

The following are the subfunctions to be accomplished under this OHMIS function:

1. Program determines what access the user has to the OHMIS data base, including what OHMIS service area (ID10) is within the users purview and which Menu Selections are within the users purview.
2. The program conducts a 'suspense check', i.e., looks for all actions (requirements and reminder notices) for which the suspense date has arrived.
3. Program identifies all overdue data requests.
4. Program identifies all tasks that need to be scheduled or rescheduled. Program generates new 'blank' monthly schedule showing availability and time use for all time slots for all users in the OHMIS service area.
5. Program generates 'automatic' outputs, i.e., outputs generated each time a user of a given type logs on. These automatic outputs include:
  - a. Outstanding Requirements Checks Needed List (02)
  - b. Outstanding Requirements List (04)
  - c. Reminder Notice List (05)
  - d. Outstanding Allowable Limits Checks Needed List (010)
  - e. Outstanding Data Requests List (013)
  - f. Daily Schedule (014)
  - g. Scheduling Notices (015)
  - h. Scheduled Task Description (016)
  - i. List of Unscheduled Tasks (017)

TRIGGERING STEPS IN THIS FUNCTION: None

### STEP F1A-1

User identifies self and provides password. Program checks password.

PREVIOUS STEP: Each time user 'logs on' to the OHMIS system.

INPUTS (S = Selection; Q = Query (not stored); E = Entry (stored);  
R = Retrieval):

#### Menu Selection and Input Sequence:

S1: Pre-menus; log on program sequence

Q1: OHMIS user identifier (ID13)

Q2: OHMIS password

#### Data Retrievals:

DL6: OHMIS user/position identifier (ID13/ID14) by OHMIS service area (ID10) list.

DL7: OHMIS user identifier (ID13) by password list

PROCESSING (P = Process Substep; FN = For Next (program logic loop)):

P1: Ask user for Q1 (user identifier (ID13)) and Q2 (password). Determine if the password (Q2) is consistent with the OHMIS user identifier (ID13) (Q1). Yes = P2; No = P6.

P2: Retain (i.e., temporarily store) the Q1 throughout the time that the user remains logged on to the system.

P3: Match the ID13 from Q1 to the OHMIS service area identifier (ID10) using DL6.

P4: Store the R3 (current date) and ID10 from P3 until next log on by an OHMIS user from this OHMIS service area (ID10).

P5: GO TO P1 Step F1A-2

P6: Requery for Q1 and Q2

OUTPUTS AND GENERATION OF DATA SETS: None

## STEP F1A-2

Program identifies type of OHMIS user logging on; identifies data access of this type of user; and, program determines whether 'suspense check' has been conducted for this day.

PREVIOUS STEP: Step F1A-2 follows P5 of step F1A-1

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrieval (R = Retrieval):

- R1: The OHMIS user identifier (ID13) from P2 of Step F1A-1
- R2: Current date
- R3: Last date on which an OHMIS user from the OHMIS service area (ID10) from P4 in Step F1A-1
- DL6: OHMIS user/position identifier (ID13/ID14) by OHMIS service area (ID10) list
- DL8: OHMIS user/position identifier (ID13/ID14) by OHMIS user/position type (CT1/CT2) list
- DL44: Menu Selection Sequence by OHMIS user type (CT1)

PROCESSING (P = Process Substep; FN = For Next (program logic loop)):

- P1: Match the ID13 from R1 to the OHMIS user type code (CT1) using DL8.
- P2: Retain the CT1 from P1 throughout the time that the user remains logged on to the OHMIS system.
- P3: Identify the appropriate Menu Selection Sequence for the CT1 from P2, using DL44.
- P4: Match the ID13 from R1 to the OHMIS service area identifier (ID10), using DL6.
- P5: Retain the ID10 from P4 throughout the time that the user remains logged on to the OHMIS system.
- P6: Is the last log on date (R3) equal to the current date (R2)? Yes = P7; No = P8.
- P7: GO TO P22 of Step F1A-3

STEP F1A-2

P8: GO TO P1 of Step F1A-3

OUTPUTS AND GENERATION OF DATA SETS: None

### STEP F1A-3

This Step covers those processing steps that should also only be done once a day. The program conducts a check for any requirements or Reminder Notices for which the suspense date has arrived, i.e., conducts a suspense check. Also checks to determine whether there are any outstanding data requests (i.e., OHMIS forms that have been sent out for completion, but not returned) that are over due. Also determines if there are any tasks that need to be scheduled and, if so, goes to Function F4A.

PREVIOUS STEP: Step F1A-3 follows P8 of Step F1A-2

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

- R1: OHMIS service area identifier (ID10) from P5 of Step F1A-2
- R2: Current date
- R3: OHMIS user type code (CT1) from P2 of Step F1A-2
- R4: Next available requirement implementation identifier(s) (ID9) (Note: All identifiers for data sets are assigned in sequential number order by the program. The program must keep track of the last identifier used for each type of identifier.)
- R5: Date one week prior to the current date, i.e., prior to R2
- R6: Once a month date on which new DS27 data is generated (Note: This date will be chosen once at the initiation of OHMIS, e.g., the first of the month.)
- DS1: Requirement description data
- DS4: Requirements suspense data
- DS22: Outstanding (uncompleted) forms monitoring data
- DS24: Specific task scheduling data
- DS26: Regular weekly schedule data
- DS27: Monthly schedule data (availability and use)
- DS28: Contact and location data

STEP F1A-3

- DL3: Outstanding requirements list by OHMIS service area
- DL9: Reminder Notice list by OHMIS service area
- DL11: List of active requirement application identifiers (ID5) for requirements suspense data by OHMIS service area
- DL26: List of new outstanding data requests (not overdue) by OHMIS service area
- DL27: List of outstanding data requests (no due date specified) by OHMIS service area
- DL28: List of overdue data requests by OHMIS service area
- DL31: List of task identifiers for tasks that cannot be scheduled by OHMIS service area
- DL32: List of the employee identifier (ID4) that is one of the requirement implementation unit(s) by the corresponding requirement application identifier (ID5) and OHMIS service area identifier (ID10) for those ID5s that identify requirement suspense data sets (DS4) that will trigger an 'employee transport' type of task
- DL33: List of monthly schedule identifiers (ID27) by OHMIS service area (ID10)
- DL35: List of requirement implementation identifiers (ID9) for requirements having tasks that need to be scheduled by OHMIS service area (ID10)
- DL39: List of task identifiers (ID23) for tasks that need to be rescheduled by OHMIS service area (ID10)
- DL40: List of weekly schedule identifiers (ID28) of OHMIS service area (ID10) and employee identifier (ID4)
- DL43: List of weekly schedule identifiers (ID28) by contact identifiers (ID26) and by OHMIS service area (ID10).

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

- P1: Identify the requirement application identifiers (ID5) on DL11 that match the ID10 from R1.
- P2: Retain the ID5 from P1 on a temporary list throughout Step F1A-3, called the P2 list.

### STEP F1A-3

FN1: FOR each ID5 on the P2 list:

- P3: Identify the DS4 data corresponding to ID5; identify the DS1 data corresponding to the requirement identifier (ID6), if any, on this DS4 data.
- P4: Is the 'next suspense date' field on the DS4 data equal to or earlier than the current date? Yes = P5; No = P12.
- P5: Generate a new DS5 data set based on the DS4 and DS1 data identified in P3; assign the next available ID9 from R4. Is the DS4 data from P3 for a Reminder Notice (i.e., not a requirement)? Yes = P6; No = P7.
- P6: Add the ID9 from P5, the ID5 from this iteration of FN1, and the ID10 from R1 to DL9; GO TO P8.
- P7: Add the ID9 from P5 and the ID10 from R1 to DL3.
- P8: Determine if the DS1 data from P3 (or the DS4 data, if this is a Reminder Notice type of suspense data) contains a task type code (CT8). If yes, add the ID9 and ID10 from the DS5 data generated in P5 to the DL35 list.
- P9: Calculate the new 'next suspense date' for the DS4 data from P3 (using the 'suspense interval'); is the new next suspense date later than the 'last suspense date' on the DS4 data from P3? Yes = P10; No = P11.
- P10: Deactivate the DS4 data, i.e., place the current date (R2) in the deactivation date for the DS4 data and remove the ID5 from DL11. Delete the entry (if any) for the ID5 in this iteration of FN1 from the DL32 list. GO TO P12.
- P11: Replace old 'next suspense date' on the DS4 data from P3 with the new 'next suspense date' calculated in P9.
- P12: NEXT FN1; end of FN1; GO TO P13.
- P13: Identify all of the complete forms identifiers (ID18) on DL26 that match the ID10 from R1.
- P14: Retain the ID18 from P13 on a temporary list throughout Step F1A-3 called the P14 list.

FN2: FOR each ID18 on the P14 list:

- P15: Identify the DS22 data corresponding to the ID18.
- P16: Does the DS22 data from P15 specify a length of time by which the outstanding form is due? Yes = P18; No = P17.
- P17: Remove the ID18 for this execution of FN2 from the DL26 list and add it to the DL27 list. GO TO P21.

STEP F1A-3

- P18: Add the length of time before the form is over due specified in the DS22 data from P15 to the date that the DS22 data was generated, i.e., identify a date due.
- P19: Is the date due from P18 equal to or greater than the current date from R2? Yes = P20; No = P21.
- P20: Remove the ID18 for this execution of FN2 from the DL26 list and add it to the DL28 list.
- P21: Next FN2; end of FN2, GO TO P25.
- P22: Is the CT1 from R3 for an OHMIS Data Processing Staff type of user? Yes = P23; No = P24 (Note: One or more of the OHMIS user type codes (CT1) will be designated as codes identifying OHMIS Data Processing Staff type of users.)
- P23: GO TO P1 of Step F1A-4.
- P24: GO TO P19 of Step F1A-5.
- P25: Review the DL33 list and obtain the monthly schedule identifiers (ID27) from this list for the ID10 from R1. Put on a temporary list called the P25 list.
- FN3: FOR each ID27 on the P25 list:
- P26: Locate the DS27 data corresponding to the ID27 in this iteration of FN3.
- P27: Does the DS27 data from P26 cover the date from R5, i.e., is it for the month that includes the date one week prior to the current date (R2)? Yes = P28; No = P34
- P28: Locate the filled fields covering the R5 date on the DS27 data from P26, i.e., locate the tasks scheduled one week prior to this date. Place each of the task identifiers (ID23) that are scheduled on the DS27 data from P26 for the date in R5 onto a temporary list, called the P28 list.
- FN3.1:FOR each ID23 on the P28 list:
- P29: Determine if there currently exists a set of DS24 data for the task with this ID23. Yes = P30; No (i.e., the task has been completed) = P31
- P30: Place the ID23 from this iteration of FN3.1 on a list called the P30 list. Also erase all scheduling information about this task (e.g., start and stop time, whether scheduled in correct time use, etc.) from the DS24 data.
- P31: NEXT FN3.1; end of FN3.1, GO TO P32.



### STEP F1A-3

P32: Is the R5 date the last date covered on the DS27 data from P26? Yes (i.e., all tasks on this DS27 data have been set up to be rescheduled) = P33; No = P34

P33: Erase the DS27 data located in P26; erase the ID27 for this iteration of FN3 from the DL33 list.

P34: NEXT FN3; end of FN3, GO TO FN5 (P51).

P35: Is the current date (R2) the same as the date of the month identified for generating new DS27 data (R6)? Yes = P36; No = P37.

P36: Generate a flag indicating that it was necessary to go to the Function F4C subroutine from Step F1A-3 and the program should return to P37 of Step F1A-3 when Function F4C is completed. Retain this flag throughout the time the user is logged on to the system or until this flag is erased at the completion of Function F4C. GO TO P1 of Step F4C-1.

P37: Are there any task identifiers (ID23) on the DL39 list for the ID10 from R1, i.e., tasks that need to be rescheduled? Yes = P40; No = P38

P38: Are there any task identifiers (ID23) on the DL31 list for the ID10 from R1, i.e., tasks that could not be scheduled previously? Yes = P40; No = P39

P39: Are there any requirement implementation identifiers (ID9) on the DL35 list, i.e., requirements having tasks that need to be scheduled? Yes = P40; No = P41

P40: GO TO P1 of Step F4A-1. When Function F4A is completed the program will return to P41 of Step F1A-3.

P41: Review the DL40 list and obtain the weekly schedule identifiers (ID28) from this list for the ID10 from R1. Put these ID28s on a temporary list called the P41 list.

FN4: FOR each ID28 on the P41 list:

P42: Locate the DS26 data corresponding to the ID28 in this iteration of FN4.

P43: Identify the deactivation date on the DS26 data located in P42. Is this date equal to or later than the R2 data (current date)? Yes = P44; No = P50 (next FN4)

P44: Erase the DS26 data located in P42.

P45: Erase the ID28 for this iteration of FN4 from the DL40 list.

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P46: Review the DL43 list and identify all entries (ID26s) for the ID28 for this iteration of FN4 on this list. Put these ID26s on a temporary list called the P46 list. Erase the entries from the DL43 list.

FN4.1: FOR each of the contact identifiers (ID26) on the P46 list:

P47: Locate the DS28 data corresponding to the ID26 for this iteration of FN4.1.

P48: Erase the ID26 for this iteration of FN4.1 from the DS28 data located in P47.

P49: NEXT FN4.1; end of FN4.1, GO TO P50.

P50: NEXT FN4; end of FN4, GO TO P22.

FN5 (from P34): FOR each task identifier (ID23 on the P30 list:

P51: Add the ID23 for this iteration of FN5 and the ID10 from R1 to the DL39 list.

P52: Locate the DS24 data corresponding to the ID23 for this iteration of FN5.

P53: Using the DS24 data from P52, identify the time slot information for the start time of the task in this iteration of FN5.

P54: Locate the DS27 data corresponding to the monthly schedule identifier (ID27) that is part (1) of the time slot information located in P53.

P55: Change the answer on the DS24 data from P3 as to whether this task is scheduled to be a 'No' and enter the code 'C' (task must be rescheduled) as an explanation for why the task is not scheduled. Also erase all scheduling information from this DS24 data, i.e., the information about the scheduling of the task as it was previously scheduled (e.g., start and end time slot information, whether the task was scheduled before the due date, number of interruptions, etc.). Do not erase the information about whether more than one person will perform this task.

FN5.1: FOR each time slot in which the task for this iteration of FN5 was previously scheduled beginning with the start time slot identified in P53 and the DS27 data located in P54 and continuing with the time slot identified in P58:

P56: Locate the time slot for this iteration of FN5.1.

STEP F1A-3

- P57: Determine whether the scheduling of the task continues. (This is shown on the DS27 data for the time slot in this iteration of FN5.1 as located in P56.) Yes = P58; No = P61
- P58: Identify the next time slot in which the scheduling of this task continues. (From the DS27 data for the P56 time slot.)
- P59: Erase all of the scheduling information for the task in this iteration of FN5 from the DS27 time slot located in P56.
- P60: NEXT FN5.1. (End of FN5.1 will not be reached.)
- P61: Using the DS24 data from P52, determine if there more than one person scheduled to perform this task. s = P62; No = P35
- P62: Identify the up to 3 monthly schedule identifier (DS27) on the DS24 data located in P52 that specify the ly schedule data (DS27) on which the scheduling for task for the additional persons scheduled to perform the task is shown to start. Put the starting DS27s on a temporary list, called the P62 list.

FN5.2: FOR each ID27 on the P62 list:

- P63: Locate the DS27 data corresponding to the ID27 for this iteration of FN5.2.
- FN5.2.1: FOR each time slot in which the task in this iteration of FN5 is already scheduled and is, therefore, also scheduled for an additional person to perform the task at the same time, beginning with the date of the month and the time slot number that are parts (2) and (3) of the start time slot identified in P53 on the DS27 data located in P63 and continuing with the time slot identified in P66.
- P64: Locate the time slot for this iteration of FN5.2.1.
- P65: Determine whether the scheduling of the task continues to another time slot. (This information is shown on the DS27 data for the time slot for this iteration of FN5.2.1 as located in P64.) Yes = P66; No = P69 (next FN5.2)
- P66: Identify the next time slot in which the scheduling of this task will continue. (From the DS27 data for the P64 time slot.)

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P67: Erase all of the scheduling information for the task in this iteration of FN5 from the DS27 data time slot located in P64.

P68: NEXT FN5.2.1. (End of FN5.2.1 will not be reached.)

P69: NEXT FN5.2; end of FN5.2, GO TO P70.

P70: Change the answer to the question on the DS24 data located in P52 about whether there are additional persons scheduled to perform this task to be 'No'. Erase the information about the additional persons previously scheduled to perform this task shown on the DS24 data.

P71: GO TO P35.

OUTPUTS AND GENERATION OF DATA SETS:

DS5: Requirement implementation data.

#### STEP F1A-4

Program determines whether the 'automatic' outputs for the user who has logged on have already been generated.

PREVIOUS STEP: Step F1A-4 follows P23 of Step F1A-3.

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

- R1: Current date
- R2: OHMIS user type code (CT1) From P2 of Step F1A-2, i.e., the code for the OHMIS Data Processing Staff type of user.
- R3: OHMIS service area identifier (ID10) from P5 of step F1A-2
- R4: Last date on which an OHMIS user of the type identified in R2 (i.e., a Data Processing Staff type of user) for the OHMIS service area identified in R3 logged on to the system, i.e., date last set of 'automatic' outputs were generated.

PROCESSING (P = Process Substep; FN = Nor Next (program logic loop)):

- P1: Is the last log on date from an OHMIS Data Processing Staff user (R4) equal to the current date (R1)? Yes = P2; No (i.e., current date is later) = P3.
- P2: GO TO P19 of Step F1A-5
- P3: GO TO P1 of Step F1A-5

OUTPUTS AND GENERATION OF DATA SETS: None

### STEP F1A-5

Generate 'automatic' output for OHMIS Data Processing Staff user, i.e., outputs that are generated once each day for each OHMIS service area when the OHMIS Data Processing Staff user for the service area logs on to the system.

PREVIOUS STEP: Step F1A-5 follows P3 of Step F1A-4

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

- R1: OHMIS service area identifier (ID10) from P5 of Step F1A-2
- R2: OHMIS user type (CT1) from P2 of Step F1A-2
- R3: Current date
- R4: Two weeks later than the current date (R3)
- DS1: Requirement description data
- DS2: Requirements check request data
- DS5: Requirements implementation data
- DS9: Current user/position identity and address data
- DS23: Task description data
- DS24: Specific task scheduling data
- DS27: Monthly schedule data (availability and use)
- DL3: Outstanding requirements list by OHMIS service area (ID10)
- DL9: Reminder Notice list by OHMIS service area (ID10)
- DL12: List of requirement check request identifiers (ID1) by OHMIS service area (ID10)
- DL17: List of allowable limits check request identifiers (ID22) by completed form identifier (ID18) and by OHMIS service area (ID10)
- DL22: List of active allowable limits application identifiers (ID20) by forms specification identifier (ID16) and OHMIS service area (ID10)

STEP F1A-5

- DL27: List of outstanding data requests (ID18) (no due date specified) by OHMIS service area (ID10)
- DL28: List of over due data requests by OHMIS service area (ID10)
- DL31: List of task identifiers (ID23) for tasks that cannot be scheduled by OHMIS service area (ID10)
- DL33: List of monthly schedule identifiers (ID27) by OHMIS service area (ID10)

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

- P1: Identify the requirement check request identifiers (ID1) on DL12 that match the ID10 from R1.
- P2: Retain the ID1s from P1 on a temporary list throughout Step F1A-5. Called the P2 list.
- P3: Print 02 from ID1 on P2 list.
- P4: Identify the requirement implementation identifiers (ID9) on the DL3 list that match the ID10 from R1.
- P5: Retain the ID9s from P4 on a temporary list throughout Step F1A-5. Called the P5 list.
- FN1: FOR each ID9 on the P5 list:
  - P6: Locate the DS5 data corresponding to the ID9.
  - P7: Does the DS5 data show that the requirement has been executed? Yes = P8; No = P10.
  - P8: Retain the ID9 on a temporary list, called the P8 list, throughout Step F1A-5.
  - P9: GO TO P11.
  - P10: Retain the ID9 on a temporary list throughout Step F1A-5, called the P10 list.
  - P11: NEXT FN1; end of FN1, GO TO P12
- P12: For each ID9 on the P8 list, identify the DS5 data corresponding to the ID9 and identify the primary person responsible for implementing the requirement; sort the ID9s on the P8 list in order of this person; print a separate 04 for each such person.

#### STEP F1A-5

- P13: For each ID9 on the P8 list, identify the DS5 data corresponding to the ID9 and identify the person, if any, who is to supervise the execution of the requirement; sort the ID9s on the P8 list in order of this person; print a separate 04 for each such person.
- P14: For each ID9 on the P10 list, identify the DS5 data corresponding to ID9 and identify the person who is to approve the disposition of the requirement; sort the ID9s in order of this person; print a separate 04 for each such person.
- P15: Identify the requirement implementation identifiers (ID9) on the DL9 list that match the ID10 from R1.
- P16: Retain the ID9s from P15 on a temporary list throughout Step F1A-5, called the P16 list.
- P17: For each ID9 on the P16 list, identify the DS5 data corresponding to the ID9 and identify the person responsible for executing the action given in the DS5 data; sort the ID9s in order of this person; print a separate 05 list for each such person.
- P18: GO TO P20.
- P19: End of Function F1A; present the appropriate type of Menu '0' (First Level Menu), as determined by the CT1 from R2, to the user. GO TO the function corresponding to the user's Menu Selection Sequence.
- P20: Identify the allowable limits check request identifiers (ID22) on DL17 that match the ID10 from R1.
- P21: Retain the ID22 from P20 on a temporary list throughout Step F1A-5, called the P21 list. Print an 010 from the ID22 on the P21 list.
- P22: Omitted.
- P23: Identify the completed form identifiers (ID18s) on the DL28 list that match the ID10 on R1.
- P24: Retain the ID18s from P23 on a temporary list throughout Step F1A-5, called the P24 list.
- P25: For each ID18 on the P24 list, locate the corresponding DS22 data.
- P26 - P27: Omitted.
- P28: Sort the ID18s on the P24 list in order of the employee identifier (ID4) of the person who is supposed to complete



STEP F1A-5

the form. The data on this person is provided on the DS22 data.

- P29: Print an O13 from the ordered list of ID18s generated in P28.
- P30: Identify the completed form identifiers (ID18) on the DL27 list that match the ID10 on R1.
- P31: Retain the ID18s from P30 on a temporary list throughout Step F1A-5, called the P31 list.
- P32: For each ID18 on the P31 list, locate the corresponding DS22 data.
- P33: Sort the ID18s on the P31 list in order of the ID4 for the person who is supposed to complete the form.
- P34: Print an O13 from the ordered list of ID18s generated in P33.
- P35: Identify the monthly schedule identifiers (ID27s) on the DL33 list for the ID10 from R1. Put on a temporary list called the P35 list.

FN2: FOR each ID27 on the P35 list:

- P36: Locate the DS27 data corresponding to the ID27.
- P37: Does the DS27 data from P36 cover the current date (R3), i.e., is it a monthly schedule for the month that includes the current date? Yes = P38; No = P41.
- P38: Locate the filled fields covering the R3 date (current date) on the DS27 data from P36, i.e., locate the tasks scheduled on this DS27 data for the current date. Place the task identifiers (ID23) for each of these tasks on a temporary list called the P38 list.
- P39: Use the ID23s on the P38 list and the corresponding DS24 data for these tasks to print an O14.
- P40: Print an O16 for each of the ID23s on the P38 list.
- P41: Does the DS27 data located in P36 cover the R4 date (i.e., the date two weeks later than the current date)? Yes = P42; No = P47.
- P42: Locate the filled fields covering the R4 date (i.e., the date two weeks from the current date) on the DS27 data from P26, i.e., locate the tasks scheduled on this DS27

#### STEP F1A-5

data for the R4 date. Place the task identifiers (ID23) for each of these tasks on a temporary list called the P42 list.

FN2.1: FOR each of the ID23s on the P42 list:

P43: Locate the DS24 data corresponding to this ID23; locate the DS23 data corresponding to the task type code (CT8) on this DS24 data.

P44: Does the DS23 data from P43 indicate that this is a task for which a Scheduling Notice is needed? Yes = P45; No = P46.

P45: Generate an O15 for the task with the task identifier (ID23) for this iteration of FN2.1. Indicate in the instructions given on this O15 that this is the 'two weeks previous' Scheduling Notice (O15) for the task, i.e., the third type of Scheduling Notice.

P46: NEXT FN2.1; end of FN2.1, GO TO P47

P47: NEXT FN2; end of FN2, GO TO P48

P48: Review the DL31 list and identify the task identifier (ID23) for those tasks from the ID10 in R1. Put on a temporary list called the P48 list.

P49: Print an O17 covering the ID23s on the P48 list.

P50: GO TO P19.

#### OUTPUTS AND GENERATION OF DATA SETS:

O2: Outstanding Requirements Checks Needed List

O4: Outstanding Requirements List (three series; one for each person who is to: execute requirements, manage (supervise) requirements, approve requirements).

O5: Reminder Notice List (one series; one List for each person who is to execute the actions on the Reminder Notice List)

O10: Outstanding Allowable Limits Checks Needed Lists

O13: Outstanding Data Requests Lists (two lists; one for over due forms and one for forms without a due date)

O14: Daily Schedule (one series, i.e., one Daily Schedule for each person who has time available for scheduling on this date, i.e., for each person for which there is current regular weekly schedule availability data (DS26))

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- 015: Scheduling Notice (for task requiring an 015 that are due two weeks from the current date)
- 016: Scheduled/Not Scheduled Task Description (for each of the tasks that are scheduled today, i.e., the tasks that are on the series of Daily Schedules (014) for today)
- 017: List of Unscheduled Tasks

## FUNCTION 1B

### Triggering Step Transparent Function

(Functional Data Flow)

This functional data flow describes the data processing which occurs each time the user executes a program sequence which has been designated as a 'triggering step'. In this function, the information triggered OHMIS requirements that are potentially applicable are identified.

A triggering step is a step in the OHMIS program logic (usually a data entry step) which has been designated as a triggering step. A step is designated as a triggering step by the OHMIS program designer. This designation means that the OHMIS program allows the user to link information triggered requirements to the execution of the triggering step. That is, once a step is designated as a triggering step, a check for possible requirements is made each time that that triggering step is executed. For example, adding an employee to the Potential New Hire List (DL2; 07) may be designated as a triggering step. This would mean that the user could specify that certain requirements (e.g., a preplacement physical) be triggered each time a new employee is added to the DL2 list, i.e., for each execution of this triggering step.

Each time a triggering step is executed, the program may generate requirements check request data (DS2) as described in this Functional Data Flow. Through this data, the user is instructed to determine whether any requirements are applicable, and, if so, generate requirements implementation data (DS5), i.e., the user is instructed to conduct a requirements check (see Function F2A). Alternatively, if there is sufficient data available in the OHMIS data base at the time that the triggering step is executed, the program will generate the applicable requirements implementation data directly as a part of this Functional Data Flow. Throughout the OHMIS Functional Data Flows, the Steps that have been designated as triggering steps will be identified in the 'Triggering Steps in this Function' section and the types of information triggered requirements that these triggering steps may trigger will be identified in the 'Some Examples of Requirements to be Triggered by this Triggering Step' section.

SUMMARY OF SUBFUNCTIONS: The following are the subfunctions to be accomplished under this OHMIS function:

1. To identify all potentially applicable requirements and, if possible, determine whether they are applicable and generate the corresponding requirements implementation data (DS5) for them.
2. If sufficient information is not available in the OHMIS data base to determine whether requirements are applicable at the time that the triggering step is executed, this program will generate requirements check request data

FUNCTION 1B

(DS2). Through the use of the DS2 data, the user will provide the missing information needed to determine if requirements are applicable.

TRIGGERING STEPS IN THIS FUNCTION: None

### STEP F1B-1

Determine if there are any information triggered applications of requirements prescribed by the OHMIS users as being potentially triggered by the execution of the triggering step for the OHMIS service area to which the user executing the step belongs.

PREVIOUS STEP: Step F1B-1 follows whenever a user executes a step in the OHMIS program sequence that has been designated as a triggering step.

INPUTS (S = Selection; Q = Query (not stored); E = Entry (stored); R = Retrieval):

#### Menu Selection and Input Sequence:

S1: Any of the program sequences that have been designated as triggering steps

Q/E1-5: Requirement implementation units. For a given triggering step there may be up to five data elements entered as a part of this triggering step that are designated as requirement implementation units. These are the unit(s) about which the check for applicable requirements triggered by the triggering step is to be conducted. For example, if the triggering step is adding a new employee to the Potential New Hire List (DL2; 07), the identifier of the particular employee added in this execution of the triggering step would be the value for a requirement implementation unit. This particular employee would be the person about which any requirements (i.e., those found to be applicable as a result of the examinations of the requirements triggered by this triggering step) would be implemented.

#### Date Retrievals:

R1: Triggering step identifier (ID2) for the triggering step, the execution of which triggers this execution of Function F1B

R2: OHMIS service area identifier (ID10) retained in P5 of Step F1A-2

DL10: List of active requirement application identifiers (ID5) for information triggered requirements applicability data (DS3) by triggering step (ID2) and by OHMIS service area (ID10).

PROCESSING (P = Process Substep; FN = For Next (program logic loop)):

STEP F1B-1

- P1: Retain the triggering step identifier (ID2) from R1 throughout Function F1B.
- P2: Are there any requirement application identifiers (ID5) on the DL10 list that match the ID2 from R1 and the ID10 from R2? Yes = P3; No = P4
- P3: GO TO P1 of Step F1B-2.
- P4: End of Function 1B; return to the program sequence in which the triggering step was executed.

OUTPUTS AND GENERATION OF DATA SETS: None

## STEP F1B-2

Identify the potentially applicable requirements to be triggered by the execution of this triggering step.

PREVIOUS STEP: Step F1B-2 follows P3 of Step F1B-1.

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

- R1: Next available requirement check request identifier (ID1)
- R2: Q/E 1-5 from Step F1B-1
- R3: The triggering step identifier (ID2) retained in P1 of Step F1B-1
- R4: OHMIS service area identifier (ID10) retained in P5 of Step F1A-2
- R5: Current date
- DL10: List of active requirement application identifiers (ID5) for information triggered requirements applicability data (DS3) by triggering Step ID2 and by OHMIS service area (ID10).

PROCESSING (P = Process Substep; FN = For Next (program logic loop)):

- P1: Retain the ID1 from R1 throughout Function F1B.
- P2: Generate a new set of DS2 data: Assign the ID1 from R1, the ID10 from R4, the ID2 from R3, the date from R5 and the requirement implementation units from R2.
- P3: Identify the requirement application identifiers (ID5) on the DL10 list that match the ID2 from R3 and the ID10 from R4.
- P4: Retain the ID5 from P3 on a temporary list throughout Function F1B.

OUTPUTS AND GENERATION OF DATA SETS:

- DS2: Requirements Check Request Data



### STEP F1B-3

Determine whether the values of the requirement implementation units entered as a part of the triggering step match the prescribed values for these units given for each potentially applicable requirement for it to be considered applicable.

PREVIOUS STEP: STEP F1B-3 follows Step F1B-2.

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

- R1: The temporary list of requirement application identifiers (ID5) from P4 of Step F1B-2
- R2: The requirement check request identifier (ID1) retained in P1 of Step F1B-2
- R3: The DS2 data (requirement check request data) generated in P1 of Step F1B-2, i.e., the DS2 data with the ID1 retrieved in R2
- DS1: Requirement description data
- DS3: (Information triggered) requirements applicability data

PROCESSING (P = Process Substep; FN = For Next (program logic loop)):

- FN1: FOR each ID5 on the R1 list:
  - P1: Identify the DS3 data corresponding to the ID5.
  - P2: Do the values prescribed for requirement implementation units on the DS3 data from P1 match the values for these units on the DS2 data from R3? Yes = P3; No = P5
  - P3: Retain the ID5 on a temporary list throughout Function F1B.
  - P4: Begin the generation of a new set of DS8 data. Assign the ID1 from R2; the ID5 from this iteration of FN1; and the requirements identifier (ID6) from the DS3 data referenced in this iteration of FN1. Also assign spaces for the values (not entered yet) for the data element types that make up the up to 25 applicability characteristics given in the DS3 data referenced in this iteration of the FN1 loop.

STEP F1B-3

P5: NEXT FN1; end of FN1, GO TO P6.

P6: Are there any ID5s on the P3 list? Yes = P7; No = P8

P7: GO TO Step F1B-4.

P8: Erase the DS2 data from R3.

P9: GO TO P4 of Step F1B-1.

OUTPUTS AND GENERATION OF DATA SETS:

DS8: Values data for requirement applicability characteristics

#### STEP F1B-4

Determine if all information needed to decide if each potentially applicable requirement if in fact applicable is available. If so, determine if applicable and, if so, add new requirements implementation data (DS5). If not applicable, delete potentially applicable requirements. If not able to determine if applicable, retain requirement check request data (DS2) needed to trigger a requirements check (Function F2A) for the user to determine if the requirement is applicable. Otherwise, delete the DS2 data.

PREVIOUS STEP: Step F1B-4 follows P7 of Step F1B-3.

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

- R1: The temporary list of requirement application identifiers (ID5) retained in P3 of Step F1B-3, i.e., the identifiers for potentially applicable requirements
- R2: The requirement check request identifier (ID1) retained in P1 of Step F1B-2
- R3: The values for any of the data element types currently available in the OHMIS data base that have been designated as applicability characteristics data element types in the DS3 data corresponding to the ID5s on the R1 list
- R4: The next available requirement implementation identifier(s) (ID9)
- R5: The OHMIS service area identifier (ID10) from P5 of Step F1A-2
- R6: The sets of values data from requirement applicability characteristics (DS8) for the RD1 from R2, i.e., the DS8 data generated in Step F1B-3
- R7: Requirements check request data (DS2) with the ID1 in R2
- R8: Next available requirement application identifier (ID5)
- DS1: Requirement description data
- DS3: (Information triggered) requirements applicability data

STEP F1B-4

- DS9: Current user/position identify and address data
- DS23: Task description data
- DL3: Outstanding requirements list (ID9) by OHMIS service area (ID10)
- DL11: List of active requirement application identifiers (ID5) for requirement suspense data (DS4) by OHMIS service area (ID10)
- DL12: List of requirement check request identifiers (ID1) by OHMIS service area (ID10)
- DL32: List of the employee identifier (ID4) that is one of the requirement implementation unit(s) by the corresponding requirement application identifier (ID5) and OHMIS service area identifier (ID10) for those ID5s that identify requirement suspense data sets (DS4) that trigger an 'employee transport' type of task
- DL35: List of requirement implementation identifiers (ID9) for requirements having tasks that need to be scheduled by OHMIS service area (ID10)

PROCESSING (P = Process Substep; FN = For Next (program logic loop)):

FN1: FOR each ID5 on the R1 list:

- P1: Locate the DS3 data corresponding to this ID5; the DS1 data corresponding to the requirement identifier (ID6) on this DS3 data; and, the DS8 data from R6 for this ID5.
- FN1.1: FOR each of the up to 25 data element types (CT\$), i.e., up to 5 for each of the up to 5 requirement implementation units, identified on the DS3 data from P1 as applicability characteristics, i.e., describing the characteristics of the respective requirement implementation unit.
- P2: Is the value for the data element type (i.e., one of the R3s) currently available in the OHMIS data base? Yes = P7; No = P3
- P3: Generate a new DL5 or identify the existing DL5 with the ID1 from R2 assigned to it.
- P4: Is the data element type for this iteration of FN1.1 already on the DL5 list identified in P3? Yes = P10; No = P5

STEP F1B-4

- P5: Add the data element type for this iteration of FN1.1 to the DL5 list identified in P3.
- P6: GO TO P10.
- P7: Abstract the value for the data element type from this iteration of FN1.1 from the OHMIS data base.
- P8: Add the value from P7 to the appropriate field on the DS8 data located in P1.
- P9: Does the value for the data element type abstracted in P7 match the prescribed value for the same data element type given on the DS3 data located in P1? Yes = P10; No = P15
- P10: NEXT FN1.1; end of FN1.1, GO TO P11.
- P11: Are there any applicability characteristics data element types on the DL8 data identified in P1 that have missing values? Yes = P16; No = P12
- P12: Is the organizational level type code (CT5) for the requirement described in the DS1 data identified in P1 the organizational level type code for 'OHMIS service area' (i.e., the applicability of this requirement is not based on a type of organizational level other than OHMIS service area)? Yes (i.e., a requirement has been triggered) = P13; No = P23
- P13: Does the DS1 data from P1 (i.e., the DS1 data for the requirement that has been triggered) indicate that the requirement that has been triggered is a 'Suspense Applicability Data Generating Requirement'? Yes = P14; No = P18
- P14: Generate a new set of DS4 data, using the DS1 and DS3 data from P1. Assign the requirement application identifier (ID5) from R8. Put the ID5 assigned to the new DS4 data in P14 on the D11 list.
- P15: Is there a task type code (CT8) specified on the DS1 data from P1? Yes = P16; No = P22
- P16: Identify the CT8 on the DS1 data from P1. Locate the DS23 data corresponding to this CT8. Does the DS23 data specify that this is an 'employee transport' type of task? Yes = P17; No = P22
- P17: Put the employee identifier (ID4) that is one of the requirement implementation unit(s) from the DS4 data newly generated in P14 and the ID5 and ID10 for the new DS4 data on the DL32 list. GO TO P22.

#### STEP F1B-4

- P18: Generate a new set of DS5 data, using the DS3 data, the DS1 data and the DS8 data from P1 and the DS2 data from R7. Assign the ID9 from R4, the ID1 from R2, the ID5 for this iteration of FN1 and the ID10 from R5. Fill in the employee identifiers (ID4) on the DS5 data by matching the OHMIS user identifiers (ID13) or position identifiers (ID14) to the employee identifiers on the DS9 data.
- P19: Add the ID9 and the ID10 assigned to the DS5 data generated in P18 to the DL3 list.
- P20: Determine if the DS1 data from P1 contains a task type code (CT8). Yes = P21; No = P22
- P21: Add the ID9 and the ID10 assigned to the DS5 data generated in P18 to the DL35 list.
- P22: Erase the DS8 data located in P1.
- P23: NEXT FN1; end of FN1, GO TO P24.
- P24: Are there any remaining sets of DS8 data with the ID1 from R2? Yes = P25; No = P26
- P25: GO TO P8 of Step F1B-3.
- P26: Add the ID1 from R2 to the DL12 list.
- P27: Go to P4 of Step F1B-1.

#### OUTPUTS AND GENERATION OF DATA SETS:

- DS4: Requirements Suspense Data, i.e., date triggered requirements applicability data
- DS5: Requirements Implementation Data
- DL5: List of Requirements Applicability Characteristics for which values are missing

## FUNCTIONAL DATA FLOWS

### FOR 'F2' FUNCTIONS: Requirement Functions

Requirement functions are those that are involved in processing of data on OHMIS requirements. The requirement functions that require singular (direct) data processing steps, i.e., the entry of defined data sets for the generation of defined outputs, are not described in the Functional Data Flows for this Function because information about direct inputs and outputs can be obtained from the description of Data Sets and Outputs given elsewhere. Only the functions that involve a series of data processing steps (multiple sets of inputs and outputs) are described here.

## FUNCTION F2A

### Requirements Check Function

(Functional Data Flow)

This Functional Data Flow describes how the user will execute a 'requirements check', i.e., a check to determine whether the potentially applicable information triggered requirements identified in Function F1B are, in fact, applicable.

A requirements check is an exercise in which, for a given set of potentially applicable information triggered requirements, the user provides the missing information needed to determine whether the requirement is applicable and, if so, requirements implementation data (DS5) is generated. The information the potentially applicable requirements that need to be checked is given in the requirements check request data (DS2) which is generated by the execution of the triggering step (see Function F1B and Step F1A-5). The user specifies that s/he wishes to execute a requirements check using Menu Selection Sequence 1.2.3.

#### SUMMARY OF SUBFUNCTIONS:

The following are the subfunctions to be performed under this OHMIS function.

1. Determine which of the potentially applicable requirements identified by a requirements check request are in fact applicable and, if applicable, generate requirements implementation data (DS5).

TRIGGERING STEPS IN THIS FUNCTION: None



### STEP F2A-1

Identify the requirement check request identifier (ID1) for which this requirement check is being made. Enter the values for the missing applicability characteristics (if any) that will determine whether the potentially applicable requirements in this requirements check are in fact applicable.

PREVIOUS STEP: Step F2A-1 follows Menu Selection Sequence 1.2.3.

INPUTS (S = Selection; Q = Query (not stored); E = Entry (stored); R = Retrieval):

#### Menu Selection and Input Sequence:

- S1: 1 (OHMIS requirements data).
- S2: 2 (requirements check request data).
- S3: 3 (conduct a requirements check).
- Q1: Requirement check request identifier (ID1).
- E1-n: The values for the missing applicability characteristics data element types which determine the applicability of each of the potentially applicable requirements which are being checked for in the requirements check request identified by the ID1 from Q1. Up to 25 data element types for each potentially applicable requirement are possible. Data element types are listed on the DL5 from the ID1 for Q1. Entries are requested in P5 and entered onto from 1-n DS8 data sets (depending on the number of potentially applicable requirements for which the data element is missing in P6).

#### Data Retrievals:

- R1: Each of the sets of values data for requirement applicability characteristics (DS8) for the ID1 from Q1.
- R2: OHMIS user type (CT1) from P2 of Step F1A-2.
- R3: Requirement check request data (DS2) for the ID1 from Q1.
- DL5: List of requirements applicability characteristics for which values are missing for the ID1 from Q1.

PROCESSING (P = Process Substep; FN = For Next (program logic loop)):

STEP F2A-1

- P1: Retain the ID1 retrieved in Q1 throughout Function F2A.
- P2: Is there a DL5 for the ID1 from Q1? Yes = P4; No = P3
- P3: GO TO Step F2A-2.
- P4: Identify the DL5 list for the ID1 from Q1.
- FN1: FOR each data element type on the DL5 list identified in P4:
- P5: Request from the user the value for the data element type, i.e., request E1-n. If the user is not able to provide a value, GO TO P10.
- P6: Identify each of the DS8 data sets from R1 that are missing the value from the data element type entered by the user in P5 and enter the value from P5 onto these DS8 data sets.
- P7: NEXT FN1; end of FN1, GO TO P8.
- P8: Erase the DL5 list identified in P4.
- P9: GO TO Step F2A-2.
- P10: End of Function F2A; close out and exit to the appropriate menu '0' (first level menu) as determined by the CT1 from R2.

OUTPUTS AND GENERATION OF DATA SETS: None

## STEP F2A-2

Determine whether the potentially applicable requirements identified in this requirements check are in fact applicable by matching the values for applicability characteristics and organizational level to which the requirement is applicable against the prescribed values for these characteristics and the organizational level. If applicable, generate requirements implementation data (DS5).

PREVIOUS STEP: Step F2A-2 follows P3 or P9 in Step F2A-1.

INPUTS (S = Selection; Q = Query (not stored); E = Entry (stored); R = Retrieval):

### Menu Selection and Input Sequence:

E1: The identifier from the organizational level to which the requirement implementation units in the DS2 data belong. Request for entry is executed in P6. Values may be entered onto DS5 data in P8.

### Data Retrievals:

R1: The requirement check request identifier (ID1) from P1 of Step F2A-1.

R2: Each of the sets of values data for requirements applicability characteristics (DS8) for the ID1 from R1.

R3: Requirement check request data (DS2) for the ID1 from R1.

R4: Next available requirement implementation identifier(s) (ID9).

DS3: (Information triggered) requirements applicability data.

DS9: Current user/position identity and address data.

DL3: Outstanding requirements list (ID9) by OHMIS service area (ID10).

DS12: List of requirements check request identifiers (ID1) by OHMIS service area (ID10).

PROCESSING (P = Process Substep; FN = For Next (program logic loop)):

FN1: FOR each of the DS8 data sets from R2.

STEP F2A-2

- P1: Identify the DS3 data corresponding to the requirement application identifier (ID5) on the DS8 data and the DS1 data corresponding to the requirement identifier (ID6) on this DS3 data.
- P2: Are all of the applicability characteristics values on the DS8 data within the prescribed range of values on the DS3 data from P1? Yes = P3; No = P10
- P3: Is the type of organizational level (CT5) for which this requirement applicable the OHMIS service area type of organizational level? (The answer is given in the DS1 data from P1.) Yes = P8; No = P4
- P4: Identify the type of organizational level (CT5) at which the applicability of this requirement is determined (from the DS1 data from P1) and tell the user the type of organizational level (CT5) by which the applicability of this requirement is determined.
- P5: Print the requirement implementation units for this requirements check (as obtained from the DS2 data from R3).
- P6: Request from the user the identifier of the organizational level (of the type of organizational level (CT5) identified in P4) to which the requirement implementation units printed in P5 belong, i.e., execute E1.
- P7: Does the organizational level identifier from P6 match the range of organizational level identifiers prescribed in the DS3 data from P1? Yes (a requirement has been triggered) = P8; No = P17
- P8: Does the DS1 data from P1 (i.e., the DS1 data for the requirement that has been triggered) indicate that the requirement that has been triggered is a 'Suspense Applicability Data Generating Requirement'? Yes = P9; No = P13
- P9: Generate a new set of DS4 data using the DS1 and DS3 data from P1. Assign the requirement application identifier (ID5) from R5.
- P10: Put the ID5 assigned to the new DS4 data in P9 on the DL11 list.
- P11: Put the requirement implementation unit identifiers from the DS4 data newly generated in P9 on the DL32 list.
- P12: GO TO P17.

## STEP F2A-2

- P13: Generate a new set of DS5 data, using the DS8 data from this iteration of FN1; the DS3 and the DS1 data from P1; and the DS2 from R3. Assign the DS5 data the requirement implementation identifier (ID9) from R4; the requirement application identifier (ID5) from the DS8 data on this iteration of FN1; the ID1 from R1; and the OHMIS service area identifier (ID10) from the DS2 data. Fill in the employee identifiers (ID4) on the DS5 data by matching the OHMIS user identifiers (ID113) or position identifier (ID14) to the employee identifier on the DS9 data.
- P14: Add the ID5 and ID10 assigned to the DS5 data generated in P13 to the DL3 list.
- P15: Determine if the DS1 data from P1 contains a task type code (CT8). Yes = P16; No = P17.
- P16: Add the ID9 and ID10 assigned to the DS5 data generated in P13 to the DL35 list.
- P17: Erase the DS8 data from this iteration of FN1.
- P18: NEXT FN1; end of FN1; GO TO P19.
- P19: Erase the DS2 data retrieved from R3 from the OHMIS files.
- P20: Delete the ID1 retrieved from R3 from the DL12 list.
- P21: End of Function F2A, i.e, GO TO P10 of Step F2A-1.

### OUTPUTS AND GENERATION OF DATA SETS:

- DS4: Requirement suspense data, i.e., data triggered requirements applicability data.
- DS5: Requirements implementation data.

## FUNCTIONAL DATA FLOWS

### FOR 'F3' FUNCTIONS: OHMIS Forms Data Processing Functions

These are the set of Functional Data Flows that are related to the entry of data onto OHMIS forms. They include the generation of a blank OHMIS form (O12) of a specified type and version, the entry of data from completed forms onto the OHMIS data base and the evaluation of allowable limits specifications as they compare to data entered from OHMIS forms. The OHMIS program allows the user to create their own forms (Menu Selection Sequence 2.1.1). This allows different forms to be generated for different needs and for changes to be made easily. For example, a user may wish to add a particular piece of information to the pre-employment physical when hiring an employee for a particular new job classification. The OHMIS program allows forms to be changed or to be different for different OHMIS service areas, but still to retain the same data processing procedures. It is expected, however, that in most cases the contents of the forms will be specified at the DA level and used throughout the OHMIS system. Even those differences in forms that are required to handle specific needs, for example, the difference in forms between job classes, will in most cases, be handled by a DA-wide forms specification. In particular, it is expected that the variation in form content that is related to differences in requirements will be specified at the DS level. Individual OHMIS service areas may be allowed to add contents to forms, but, in most cases, this will be a nonrequirement type of change to the forms version. For example, the requirements of an Industrial Hygiene survey that are specified by the contents of the Industrial Hygiene survey forms will in most cases be specified at the DA level. However, individual OHMIS service areas may wish to add data elements to the Industrial Hygiene survey forms used locally to meet particular needs or particular inquiries. The contents of OHMIS forms are specified in the OHMIS data base itself (i.e., on forms description data (DS10)), the control of variation in forms content can readily be done centrally.

The specific data elements on each version of each type of OHMIS form are given by the user in Menu Selection Sequence 2.1.1 using the forms specification data (DS10). DS10 data may be entered at all levels from OHMIS service area Data Processing Staff persons to the DA level. If, for some type of forms, the DA wishes only one version of a form of a given type to be used without modification (e.g., without any additions of data elements at the local level), this can be specified by stipulating that only the 'default' version of the form will be used. This stipulation can be made at any time. The DA level can also specify that certain forms be used by certain OHMIS areas. These stipulations are made using the forms applicability factors and values data (DS12 and DS13). It is envisioned, however, that some degree of flexibility at the local level in the type of forms used will be considered desirable in many cases. The OHMIS data base is organized to enable managing a data base with different forms specifications for the same form type.

## FUNCTIONAL DATA FLOWS

Each version of an OHMIS form has space for entering the data elements specified by the user in the specification for the form and therefore each form is different. However, the format of all forms is similar in order to enable standard processing of the entry of data from all forms. The generic format of the output of all OHMIS blank forms is given in the OHMIS 'blank' form (generic) output (O12); the generic format for the input of data from OHMIS forms is given in the completed forms data set (DS14).

Section V of this report provides examples of some of the major types of forms that will be included in OHMIS. The user may, of course, create an entirely new type of form (based on the data element types provided by the OHMIS program design; see DS7). The great majority of form types that will be needed in OHMIS will probably be identified and developed before the system is initiated. Thereafter, in most cases, the user will be specifying only a different version of an already existing form type.

## FUNCTION F3A

### Generation of (Blank) Forms Function (Functional Data Flow)

This Functional Data Flow describes how a user generates a blank OHMIS form, i.e., an Output 012, either to examine the form or to use it to enter data. (See description of Output 012, i.e., the OHMIS blank form (generic) output.) These forms may be hard copy forms on which data is entered manually in preparation for entry into the computer. Alternatively, this function may enable the user to generate a data input 'screen' of the data elements on a particular form in order to input the data directly without the use of a hard copy form. The same 'screen' that may be generated in this Function is used in Function F3B to provide a forms data entry format for entering data into the computer. For the purposes of this description of Function F3 we will treat both hard copy and screen-type 'blank forms' as though they were both physical 'outputs' generated by this function.

#### SUMMARY OF SUBFUNCTIONS:

The following are the subfunctions to be accomplished under this OHMIS function:

1. Generation of a 'blank' form (012) meeting the user's specifications. This can be the specific version of a form type specified by the user, a copy of a previously generated form, or the program can identify and generate the appropriate blank form based on matching the values entered by the user with the forms applicability values data (DS13).
2. Generation of the data needed to monitor each form until it is completed, i.e., generation of outstanding (uncompleted) forms monitoring data (DS22). At any point in time OHMIS is able to identify all forms for which blank forms have been generated, but for which completed forms data (DS14) has not been entered, the person who is due to complete each outstanding form, the date it is due, etc. This subfunction is provided to reduce the labor burden of tracking the extensive data flow of the OHMIS system; it is particularly important as many of the forms will be generated by those outside of the occupational health organization.
3. Identification of those data elements that are missing from the OHMIS data base for a forms unit(s) for which the form is being generated at the time that the form is generated; and, the generation of an additional form (i.e., a Missing Data Element Type Form) to provide for the entry of these missing data elements by the user. The OHMIS program is thus set up to 'automatically' request missing data element types at the same time that other data is being requested for the same forms unit (e.g., for



## FUNCTION F3A

the same employee). This subfunction is provided to increase the quality assurance of the OHMIS data base and to reduce the labor that would be required to perform this function if it were to be done manually.

### TRIGGERING STEPS IN THIS FUNCTION:

(Note: As explained elsewhere in this report, a triggering step is an OHMIS data processing step that has been designated as one that is to generate a check for requirements that the user has previously specified are to be triggered by the execution of this data processing step (see Function F1B, triggering step transparent function, for further explanation of triggering steps)). The following are the triggering steps that are to be included in this function:

On Step F3A-3 (P7 and P9) and Step F3A-4 (P18): Entry of data to specify what type and version of a data entry form is desired, i.e., the point in the OHMIS program at which the type and version of the blank form being generated by this function is identified. It is only a triggering step if the form is being generated for use in data entry (Menu Selection Sequence 2.1.5), not if the form is generated simply for examination (Menu Selection Sequence 2.1.4).

Requirement Implementation Units for This Triggering Step (As explained in the requirements check request data (DS2), requirement implementation units are the units about which the requirements triggered by this triggering step are to be implemented.):

1. The forms specification identifier (ID16) for the version of the form generated by this execution of Function F3A.

Some Examples of Requirements to be Triggered by this Triggering Step: For this triggering step the user would enter all requirements (and recommendations), i.e., DS1 data, that are to be triggered by the intent to collect data of a certain type (as shown by the generation of a specific version of a particular type of form). Most of these requirements will depend on the type of form being generated, i.e., the requirements applicability data (DS3) would specify a particular requirement for a particular type of form. For example, the generation of a form to conduct an Industrial Hygiene survey would probably trigger different requirements than the generation of a form to conduct a medical examination. However, the following are some examples of types of requirements that may be true for most types of forms generated:

1. Quality control procedures. There will in many cases be specific requirements associated with the collection of a particular type of data that have

### FUNCTION F3A

been stipulated by the user to insure that the quality of the data is maintained.

2. Additional forms to be completed. It is expected that there will in many cases be a configuration of forms that should be completed at the same time. In these cases, once the user generates one type of form, there may be a requirement notifying the user of the other forms that should be generated and completed. This type of requirement would be especially important for additional forms containing data element types that should be updated frequently. For example, it is recommended that an update of information on the facility(ies) in which an employee works be obtained each time the OHMIS staff contacts the employee, because of the difficulty of keeping this type of data current. One of the signals for an impending OHMIS contact with an employee is a generation of a blank form designed to collect information on an employee. Therefore, it is recommended that a requirement to generate a form to update the information on the employees work facilities be triggered by triggering step 3. The requirement applicability data (DS3) for this requirement would specify that the form specification identifier (ID16), i.e., the requirement implementation unit, be for the types and versions of forms that are generated to collect data on employees, e.g., medical surveillance forms.

Note: The above are simply examples of the types of requirements that may be generated by this triggering step and how these requirements will be specified. For any given form there would be much more specific requirements (i.e., DS3 data containing specific requirements based on specific applicability values.

### STEP F3A-1

Determine and store whether the user wishes to generate a 'blank' form to merely examine it or to use the form for entry of data.

PREVIOUS STEP: Step F3A-1 Follows Whenever a User Wishes to Examine or Generate a Blank OHMIS Form.

INPUTS (S = Selection; Q = Query (not stored); E = Entry (stored); R = Retrieval)

#### Menu Selection and Input Sequence:

- S1: 2 (forms specification data)
- S2: 1 (forms description data)
- S3: 4 (examine form description data); OR,
- S3: 5 (generate a form)

Data Retrievals: None

#### PROCESSING (P = Process substep):

- P1: Retain whether S3 was a '4' (only wishes to examine a form specification) or a '5' (wishes to generate a form for use in data entry) throughout Function F3A.
- P2: GO TO P1 of Step F3A-2.

OUTPUTS AND GENERATION OF DATA SETS: None

## STEP F3A-2

Determine which of the 4 possible types of methods the user wishes to use to generate a blank form. Execute method 1, i.e., generate a previously generated form. The previously generated form can be a blank form with the identification information already completed or it can be a Missing Data Element Type Form.

PREVIOUS STEP: Step F3A-2 follows P2 of Step F3A-1.

INPUTS (S = Selection; Q = Query (not stored); E = Entry (stored); R = Retrieval):

### Menu Selection and Input Sequence:

Q1: What method does the user wish to use to generate a form. Answers may be:

- 1 = Specify a particular form that has been previously generated
- 2 = Specify a particular version (specification) of a form type
- 3 = Specify the default version of a particular form type
- 4 = Specify only the form type and the forms applicability values of the form desired and have the program determine which version of the form is applicable.

The query is in P1.

Q2: Completed form identifier (ID18). Query is in P2.

### Data Retrievals:

- R1: OHMIS user type code (CT1) from P2 of Step F1A-2.
- DS9: Current user/position identity and address data
- DS11: Forms subpart data
- DS10: Forms description data
- DS19: Missing data element information
- DS22: Outstanding (uncompleted) forms monitoring data

### PROCESSING (P = Process substep):

- P1: Ask user for answers to Q1. Retain answers (1 - 4) throughout Function F3A. 1 = P2; 2 = P11; 3 = P11; 4 = P11.

STEP F3A-2

- P2: Ask user for answers to Q2, i.e., for the ID18 of the previously generated form. Retain this answer throughout Function F3A.
- P3: Locate the DS22 data that matches the ID18 from P2. If no match, tell user and GO TO P1.
- P4: Is the DS22 data from P3 for an Missing Data Element Type Form? Yes = P5; No = P7.
- P5: For each of the missing data element type information identifiers (ID21) on the DS22 data from P3, locate the corresponding DS19 data.
- P6: Use the DS22 data from P3 and the DS19 data from P5 to obtain the data needed to output the desired form, i.e., output O12. The ID18 from P2 is the unique completed form identifier for the form. Use the standard title, instructions and form type code (CT9) for all Missing Data Element Type Forms. The address data on the form is from DS9. The data on what data element types are missing (i.e., data element type description and the completed form identifier (ID18), if any) is from the DS19 data corresponding to the ID21 on the DS22 data. The remaining data elements on the blank form (O12) are from the DS22 data. GO TO P10.
- P7: Locate the DS10 data that matches the forms specification identifier (ID16) in the DS22 from P3.
- P8: Locate the sets of DS11 data that match the forms subpart identifier(s) (ID17) given in the DS10 data located in P7.
- P9: Using the DS22 data from P3, the DS10 data from P7 and the sets of DS11 data from P8, obtain the data needed to output the desired form, i.e., Output O12. The ID18 from P2 is the unique completed form identifier for the form. The address data is from DS9. The DS22 data contains the date the form was generated; the date the form is due; the persons who are to complete the form, review the form, and receive the completed form (if these persons have been specified); and, some or all of the forms unit data element types and values. The remaining data elements on output O12 are from the DS10 data and its corresponding DS11 data.
- P10: End of Function F3A; close out all temporary files and list an exit to the appropriate Menu '0' (First Level Menu) as determined by the CT1 from R1.
- P11: GO TO P1 OF Step F3A-3.

STEP F3A-2

OUTPUTS AND GENERATION OF DATA SETS:

012: OHMIS blank form (generic) of the type specified by the user.

### STEP 3A-3

Begin generation of the data to monitor uncompleted forms (DS22).  
Begin execution of methods 2 and 3 (specified desired form version or default version) of the 4 possible methods for generating a blank form, by identifying the desired version of the form.

PREVIOUS STEP: Step F3A-3 follows P11 of Step F3A-2.

INPUTS (S = Selection; Q = Query (not stored); E = Entry (stored);  
R = Retrieval)

Menu Selection and Input Sequence: Note: All E/Q are entries ('E') onto DS22 data if R1 is a '5' and Queries ('Q') only if R1 is a '4'.

E/Q1: The form type code (CT9) for the type of blank form the user wishes to generate. Entry/Query is in P4.

E/Q2: Forms specification identifier (ID16) for version of of blank form user wishes to generate. Entry/Query is in P8.

#### Data Retrievals:

R1: The Menu Selection Sequence retained in P1 of Step F3A-1, i.e., whether the user wishes to generate a form for examination only ('4') or for use in entering data ('5').

R2: The next available completed form identifier (ID18).

R3: Current date.

R4: The answers retained in P1 of Step F3A-2, i.e., the type of method (1 - 4) the user chose to generate a blank form.

R5: The OHMIS service area identifier (ID10) retained in P5 of Step F1A-2.

DL21: List of the active default forms specification identifier (ID16) by the form type code (CT9) and OHMIS service area (ID10).

DL26: List of new outstanding data requests (ID18) (not over due) by OHMIS service area (ID10).

#### PROCESSING (P = Process substep):

P1: Retain the ID18 from R2 throughout Function F3A.

P2: Is the R1 a '4' or a '5'? 4 = P4; 5 = P3.

STEP 3A-3

- P3: Begin generating a new set of DS22 data. Assign the ID18 from P1 for this DS22 data; assign R3 as the date the DS22 data was generated; answer 'No' to the question about whether this is an Missing Data Element Type Form on the DS22 data; assign the ID10 from R5 to this DS22 data; add the ID18 from P1 to the DL26 list.
- P4: Ask for answers to E/Q1, i.e., for a form type code (CT9). Store E/Q1 on the DS22 from P3 if R1 is a '5'. Also, retain E/Q1 throughout Function F3A.
- P5: Is R4 a 2, 3, or 4? (Could not be a '1'.) 2 = P8; 3 = P7; 4 = P6.
- P6: GO TO P1 of Step F3A-4.
- P7: Use DL21 to identify the ID16 for the default forms specification for the CT9 from P4 and the ID10 in R5. Store/retain as in P4. (Triggering Step)
- P9: Ask for answers to E/Q2, i.e., the forms specification identifier (ID16). Store/retain as in P4. (Triggering Step)
- P10: GO TO P1 of Step F3A-5.

OUTPUTS AND GENERATION OF DATA SETS:

DS22: Outstanding (uncompleted) forms monitoring data.



#### STEP F3A-4

Execute first part of method 4 for generating a blank form, i.e., identify the applicable form based on the applicability values provided by the user.

PREVIOUS STEP: Step F3A-4 follows P6 of Step F3A-3.

INPUTS (S = Selection; Q = Query (not stored); E = Entry (stored); R = Retrieval):

##### Menu Selection and Input Sequence:

- Q1-n: The identifiers of values for the up to 5 types of units about which there are factors that determine the applicability of an OHMIS form. Exact number and type of identifier (CT10) or data element type (CT4) are from the DS12 data located in P1. Query is in P4.
- Q2-n: The values for the up to 5 characteristics (data element types) for each of the Q1-n identifiers above. Exact number and data element types (CT4) are from DS12 data located in P1. Query in P9.

##### Data Retrievals:

- R1: The type of form code (CT9) retained in P4 of Step F3A-3.
- R2: The completed form identifier (ID18) retained in P1 of Step F3A-3.
- R3: The OHMIS service area identifier (ID10) from P5 of Step F1A-2.
- R4: The Menu Selection Sequence retained in P1 of Step F3A-1, i.e., whether the user wishes only to examine the blank form or to use it to enter data.
- R5: The outstanding (uncompleted) forms monitoring data (DS22) for the ID18 retrieved in R2, if any.
- DS12: Forms applicability factors data.
- DS13: Forms applicability values data.
- DL24: List of form application identifiers (ID19) by form type code (CT9) and OHMIS service area (ID10); used to identify applicable DS13 data.

#### STEP F3A-4

PROCESSING (P = Process Substep; FN = For Next (program logic loop)):

- P1: Locate the DS12 data for the CT9 in R1.
- P2: Generate a blank temporary record (held throughout Function F3A), called the P2 record, that resembles the format of the DS12 data set from P1. Assign the CT9 from R1 and the ID10 from R3.
- P3: Using the DS12 data located in P1, identify the up to 5 types of units that determine the applicability of a form.
- FN1: FOR each of the up to 5 types of units from P3.
- P4: Ask user for value for the unit (Q1-n). Retain value in corresponding field on the P2 temporary record.
- P5: Using the DS12 data located in P1, identify the up to 5 characteristics (data element types) that determine the applicability of the form for the type of unit identified in P3 that is covered by this iteration of FN1.
- FN1.1: FOR each of the up to 5 unit characteristic (data element types) from P5:
  - P6: Is the value for this data element type available in the current OHMIS data base? Yes = P7; No = P9
  - P7: Locate the value for this data element type and retain it in the corresponding field on the P2 temporary record.
  - P8: GO TO P10.
  - P9: Ask user for Q2-n, i.e., the value for the data element type; store in corresponding field on the P2 temporary record. If no answer is provided, GO TO P11.
- P10: NEXT FN1.1; end of FN1.1, GO TO P14.
- P11: Tell user that it is not possible to obtain the information needed to select the applicable form.
- P12: Ask user if s/he wishes to use the default version of the form. Yes = P13; No = P10 of Step F3A-2.
- P13: Change the answer to Q1 of Step F3A-2 retained in P1 of Step F3A-2 to a '3'.
- P14: GO TO P7 of Step F3A-3.
- P15: NEXT FN1; end of FN1, GO TO P16.

STEP F3A-4

P16: Using DL24, locate all DS13 data sets for the CT9 from R1 and the ID10 from R3.

FN2: FOR each set of DS13 data from P16:

P17: Do the values for the types of units and the applicability characteristics stored in the P2 temporary record match the corresponding values on the DS13 data set? Yes = P18; No = P20

P18: Identify the forms specification identifier (ID16) on the DS13 data for this iteration of FN2. If R4 is a '5', add this ID16 to the DS22 data retrieved in R5. If R4 is '4', retain this ID16 throughout Function F3A. (Triggering Step)

P19: GO TO P10 of Step F3A-3.

P20: NEXT FN2; end of FN2, GO TO P21.

P21: Tell user was not able to find a form that matched the applicability values given by the user.

P22: GO TO P12.

OUTPUTS AND GENERATION OF DATA SETS: None

### STEP F3A-5

Determine if the user merely wishes to examine the blank form (i.e., not use it for data entry). If so, generate the blank form.

PREVIOUS STEP: Step F3A-5 follows P10 of Step F3A-3.

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

- R1: The Menu Selection Sequence retained in P1 of Step F3A-1, i.e., whether the user wishes to generate a form for examination only ('4') or for use in entering data ('5').
- R2: The completed form identifier (ID18) from P1 of Step F3A-3.
- R3: Current date.
- R4: Forms specification identifier (ID16) retained in P7 or P9 of Step F3A-3 or P18 of Step F3A-4.
- R5: The OHMIS service area identifier (ID10) retained in P5 of Step F1A-2.
- R6: The type of form code (CT9) retained in P4 of Step F3A-3.
- DS9: Current user/position identity and address data.
- DS10: Forms description data.
- DS11: Forms subpart data.

PROCESSING (P = Process Substep):

- P1: Is R1 a '4' or a '5'? 4 = P2; 5 = P6
- P2: Locate the DS10 data that matches the ID16 retrieved in R7.
- P3: Locate the sets of DS11 data that match the forms subpart identifier (ID17) given in the DS10 data from P2.
- P4: Using the DS10 data from P2 and the DS11 data from P3, obtain the data needed to output the desired form, i.e., Output O12. The address data is from DS9. Assign the ID18 from R2; the CT9 from R6; the ID16 from R4; the R3 (current date) as the date that the form is generated; and

STEP F3A-5

the ID10 from R5. The remaining data on this output is from the DS10 data and its corresponding DS11 data or can be left off if not provided on the DS10 data.

P5: GO TO P10 of Step F3A-2.

P6: GO TO P1 of Step F3A-6.

OUTPUTS AND GENERATION OF DATA SETS:

012: OHMIS blank form (generic) of the type specified by the user.

#### STEP F3A-6

Obtain the information needed to monitor the completion of each form that is to be generated for use in data entry, i.e., obtain the outstanding (uncompleted) forms monitoring data (DS22). Also, fill in as much as possible of the identification portion of the form just generated. Determine if there are any data elements missing from the OHMIS data base for the same forms unit(s) (e.g., an employee) for which the user is generating this form and, of so, generate the DS22 data for the Missing Data Element Type Forms needed to collect this missing information. Generate the blank forms specified by the user and any needed Missing Data Element Type Forms.

PREVIOUS STEP: Step F3A-6 follows P6 of Step F3A-5.

INPUTS (S = Selection; Q = Query (not stored); E = Entry (stored); R = Retrieval):

#### Menu Selection and Input Sequence:

- E1: The OHMIS user identifier (ID13) or OHMIS position identifier (ID14) or employee identifier (ID4) of the person who is supposed to complete the form, i.e., the person to whom the form is to be sent. Entry to DS22 in P9.
- E2: The OHMIS user identifier (ID13) of the person requesting the data on the form being generated and the person to whom the completed form is to be sent. Entry to DS22 in P11.
- E3: The OHMIS user identifier (ID13) or OHMIS position identifier (ID14) or employee identifier (ID4) of the person who is supposed to review the completed form. Entry to DS22 in P22.
- E4: The length of time from the date that the form was generated until the completed form is due. Entry to DS22 in P27.
- E5-n: The values for the up to 9 forms units on the form being generated. The forms units are the person (e.g., an employee) or thing (e.g., a facility) which the data on the form describes, e.g., a form for a pre-employment physical would provide data about an employee and, therefore, an employee identifier (ID4) would be the forms unit for that type of form. The type of forms unit (as distinguished from the value for the forms unit) is specified in the DS10 data for the form version. The E5-n is entered onto the DS22 data in P29.

### STEP F3A-6

#### Data Retrievals:

- R1: The completed form identifier (ID18) from P1 of Step F3A-3.
- R2: OHMIS user identifier (ID13) of the person who last logged onto the OHMIS system as retained in P2 of Step F1A-1.
- R3: Next available unique complete form identifier (ID18).
- DS9: Current user/position identify and address data.
- DS10: Forms description data.
- DS11: Forms subpart data.
- DS19: Missing data element information.
- DS22: Outstanding (uncompleted) forms monitoring data.
- DL8: OHMIS user/position identifier (ID13/ID14) by OHMIS user/position type (CT1/CT2) list.
- DL25: Missing data element list.

PROCESSING (P = Process Substep; FN = For Next (program logic loop)):

- P1: Locate the DS22 data for the ID18 from R1.
- P2: Locate the DS10 data for the forms specification identifier (ID16) in the DS22 data from P1.
- P3: Does the DS10 data from P2 have a specification for the OHMIS user type (CT1) or position type (CT2) of the type of person who is to complete the form being generated? Yes = P4; No = P9.
- P4: Using the DL8 list, determine the OHMIS user identifier (ID13) or OHMIS position identifier (ID14) that corresponds to the CT1 or CT2 from P3 for the OHMIS service area on the DS22 data from P1.
- P5: Using the DS9 data, determine the employee identifier (ID4) for the ID13 or ID14 from P4.
- P6: Print the ID13/ID14 from P4 and the ID4 from P5. Ask the user whether this is the correct identify of the person who is to complete the form being generated. Yes = P7; No = P9

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- P7: Enter the ID13 or ID14 and ID4 data onto the DS22 data from P1.
- P8: GO TO P10.
- P9: Ask user for E1. Enter the identifier (ID13 or ID14 and/or ID4) information onto the DS22 data from P1. Obtain the missing identifier information (i.e., the information not provided by the user) from the DS9 data and enter onto the DS22 data.
- P10: Print the ID13 from R2. If user if this is the user requesting the data on the form being generated, i.e., is this the person to whom the completed data should be sent? Yes = P13; No = P11
- P11: Ask user for E2. Enter the ID13 onto the DS22 data from P1.
- P12: GO TO P14.
- P13: Enter the ID13 from R2 onto the DS22 data from P1.
- P14: Using DS9, identify the employee identifier (ID4) for the ID13 entered onto the DS22 data in P11 or P13. Enter this ID4 onto the DS22 data from P1.
- P15: Does the DS10 data from P2 have a specification for the CT1 or CT2 of the type of person who is to review (sign off on) the completed form being generated? Yes = P16; No = P21
- P16: Using DL8, determine the ID13 or ID14 for the CT1 or CT2 from P15.
- P17: Using the DS9 data, determine the ID4 for the ID13 or ID14 from P16.
- P18: Print the ID13/ID14 from P16 and the ID4 from P17. Ask user whether this is the correct identify of the person who is supposed to review the completed form. Yes = P19; No = P21
- P19: Enter the ID13 or ID14 and ID4 onto the DS22 data from P1.
- P20: GO TO P23.
- P21: Ask user if wishes to designate a person who is to review the completed form. Yes = P22; No = P23
- P22: Ask user for E3. Enter the identifier (ID13 or ID14 and/or ID4) onto the DS22 data from P1. Obtain the



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missing identifier (not provided by the user) from the DS9 and enter onto the DS22 data.

- P23: Does the DS10 from P2 contain specifications for the length of time to be allowed from the time that the form is generated to the time that the form is supposed to be completed and returned? Yes = P24; No = P26
- P24: Enter the length of time from P23 onto the DS22 data from P1.
- P25: GO TO P28.
- P26: Ask the user if s/he wishes to specify the length of time in which the form being generated will be due. Yes = P27; No = P28.
- P27: Ask user for E4. Enter onto the DS22 data from P1.
- P28: Using the DS10 data from P2, abstract the up the 9 identifier types (CT10) and/or data element types (CT4) that make up the types of forms units for the form being generated. Put on a temporary list called the P28 list.
- FN1: FOR each type of forms unit on the P28 list:
- P29: Ask user for E5-n, i.e., the value for the forms unit. If the user is not able to provide the value, GO TO P38. Enter value from E5-n onto the DS22 data from P1.
- P30: Using the DL25 list, determine if there are currently any data elements missing from the OHMIS data base for the identifier that is the forms unit in this iteration of FN1, i.e., the identifier entered in P29. Yes = P31; No = P38
- P31: Locate and put on a temporary list all missing data element type information identifiers (ID21) on DL25 for the forms unit in this execution of FN1, called the P31 list.
- FN1.1: FOR each ID21 on the P31 list:
- P32: Locate the DS19 data for the ID21.
- P33: Determine from the DS19 data from P32 if this data element type is already on a Missing Data Element Type Form. Yes = P35; No = P34
- P34: Enter the ID21 for this execution of FN1.1 on the DS19 data from P32 and on a temporary list, called the P34 list, stored throughout Step F3A-6.

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P35: NEXT FN1.1; end of FN1.1, GO TO P36.

P36: Are there any ID21s on the P34 list? Yes = P37; No = P38

P37: Generate a new set of DS22 data (not the same as the DS22 data from D1) for a new form. This will be a Missing Data Element Type Form and will request the missing data element types identified on the P34 list for the forms unit in this iteration of FN1. Assign the ID18 from R3 to this new DS22 data set; also, enter this ID18 on the other forms generated list at the bottom of the DS22 data from P1. (This provides a cross-reference.) Also, add this ID18 to a temporary list, called the P37 list. For the new DS22 data, answer the question about whether this is a Missing Data Element Type Form with a 'Yes'; assign the standard Missing Data Element Type Form form type code (CT9) that is used for all forms of this type; omit the form specification identifier (ID16); use the identifier for the forms unit for this iteration of FN1 (i.e., the value given in P29) as the forms unit on the new DS22 data; and, list the ID18 from R1 on the other forms generated list at the bottom of this new DS22 data (cross-reference). Copy from the DS22 data from P1 to the DS22 data generated in this Step, the following information: the date the DS22 data was generated, the OHMIS service area identifier (ID10), the person to whom this Missing Data Element Type Form should be sent (i.e., completed by), the person to whom the completed form should be returned, and the time before the form is overdue. Leave the person who should review the completed form blank. List the ID21s from the P34 list at the bottom of this new DS22 data to indicate what types of data element types are missing and are to be gathered on this Missing Data Element Type Form.

P38: NEXT FN1; end of FN1, GO TO P39.

P39: Is there more than one forms unit on the P28 list? Yes = P40; No = P50

P40: Generate a temporary list of all possible combinations of the forms units on the P28 list, called the P40 list.

FN2: FOR each combination of forms unit identifiers on the P40 list:

P41: Using DL25, determine if there are currently any data elements missing from the OHMIS data base for the combination of forms unit identifiers in this iteration of FN2. Yes = P42; No = P49

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P42: Locate and put on a list all missing data element type information identifiers (ID21) on the DL25 list for the combination of forms units in this iteration of FN2.

FN2.1: FOR each ID21 on the P42 list.

P43: Locate the DS19 data for the ID21.

P44: Determine from the DS19 data from P43 if this data element type is already on the Missing Data Element Type Form.  
Yes = P46; No = P45

P45: Enter the ID21 for this execution of FN2.1 on the DS19 data from P43 and on a temporary list called the P45 list.

P46: NEXT FN2.1; end of FN2.1, GO TO P47.

P47: Are there any ID21s on the P45 list? Yes = P48; No = P49

P48: Generate a new set of DS22 data (not the same as the DS22 data from P1 or P37) for a new form. This will be a Missing Data Element Type Form to request the missing data element types identified on the P45 list for the combination for forms unit in this iteration of FN2. (Follow the instructions in P37, including the addition of the ID18 for this new set of DS22 data to the P37 list.)

P49: NEXT FN2; end of FN2, GO TO P50.

P50: Locate the sets of DS11 data corresponding to the forms subpart identifiers (ID17) on the DS10 data from P2.

P51: Using the DS22 data from P1, the DS10 data from P2, and the DS11 data from P50, obtain the data needed to output the desired form, i.e., Output 012. (Follow the instructions in P9 of Step F3A-2.)

P52: Are there ID18s on the P37 list (i.e., are there any Missing Data Element Type Forms that were generated during Step F3A-6)? Yes = P53; No = P10 of Step F3A-2

FN3: FOR each ID18 on the P37 list:

P53: Locate the DS22 data that matches the ID18 for this iteration of FN3.

P54: For each of the missing data element type information identifiers (ID21) on the DS22 data from P53, locate the corresponding DS19 data.

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P55: Using the DS22 data from P53 and the DS19 data from P54, obtain the data needed to output the desired form, i.e., Output 012. (Follow the instructions in P6 of Step F3A-2.)

P56: NEXT FN3; end of FN3, GO TO P57.

P57: GO TO P10 of Step F3A-2.

OUTPUTS AND GENERATION OF DATA SETS:

012: OHMIS blank form (generic) for the form desired by the user and for each Missing Data Element Type Form generated during Step F3A-6.

DS22: Outstanding (uncompleted) forms monitoring data.

### FUNCTION F3B

#### Completed Forms Data Entry and Allowable Limits Evaluation Function (Functional Data Flow)

This Functional Data Flow describes how data is entered onto the OHMIS data base from an OHMIS form.

#### SUMMARY OF SUBFUNCTIONS:

The following are the subfunctions to be accomplished under this OHMIS function:

1. Entry of data from a completed OHMIS form.
2. Entry of missing data elements onto the OHMIS data base.  
Missing data elements are values that were not available for entry at the time that input was made to the OHMIS data base. (Input can be from an OHMIS form, External Data Source or other sources.)
3. For each input to the OHMIS data base:
  - a. Determine whether there are any allowable limits specifications (DS17) applicable to the entry of this input. The applicability of an allowable limit is determined from DS15 and DS16 data. If all of the information needed needed to determine whether an allowable limits specification is applicable is not available, maintain the allowable limits check request data (DS18) so that the user may input the data needed to make this determination using Function F3C (Allowable Limits Check).
  - b. For each applicable allowable limits specification, determine whether the value entered matches the allowable limits specification, e.g., exceeds an acceptable value for a medical test result. If the determination of whether an allowable limits specification matches must be done manually, maintain the DS18 data with which the user may make this determination using Function F3C.
  - c. For each matching allowable limits specification, generate the requirements implementation data (DS5). This data will initiate the implementation and monitoring of the actions required from the entry of a value that matches an allowable limit.

TRIGGERING STEPS IN THIS FUNCTION: None

### STEP F3B-1

Identify the type and version (specification) of the form being entered. Begin to generate the completed form data set (DS14) for storing the data from the form being entered. Enter specifications of the form and the values for the form units on the DS14 data.

PREVIOUS STEP: Step F3B-1 is executed whenever the user wishes to enter data from an OHMIS form onto the OHMIS data base.

INPUTS (S = Selection; Q = Query (not stored); E = Entry (stored); R = Retrieval):

#### Menu Selection and Input Sequence:

- S1: 3 (completed forms data and uncompleted forms data)
- S2: 1 (enter data from a form)
- E1: Completed forms identifier (ID18) for the form the user is entering
- E2: Form specification identifier (ID16) of the form the user is entering
- E3: The up to 9 identifiers or values for the forms units on the form. The forms units are the identification portion of the form, i.e., the person(s) and/or thing(s) described by the completed form data (DS14). The exact data elements and format for the forms units are obtained from the DS10 data corresponding to the ID16 from E2.

#### Data Retrievals:

- R1: Current date.
- R2: Next available unique completed form identifier (ID18).
- DS10: Forms description data.
- DS11: Forms subpart data.
- DS22: Outstanding (uncompleted) forms monitoring data.

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

- P1: Ask user for E1, i.e., the ID18 that is printed on the form being entered. If the user does not have an ID18, i.e., the user is entering data directly onto an OHMIS computer screen and not from a hard copy OHMIS form (or if

### STEP F3B-1

the user accidentally used a OHMIS form generated for examination only, i.e., not for data entry) use the ID18 from R2. Retain this ID18 throughout Function F3B.

- P2: Is there a set of DS22 data for the ID18 entered in P1? Retain answer throughout Function F3B. Yes = P3; No = P4
- P3: GO TO P16.
- P4: Begin generating a new set of DS22 data. Assign the ID18 from P1. Assign the R1 as the date the DS22 data was generated. Answer the Missing Data Element Type Form question on the DS22 data set as 'No'.
- P5: Ask user for E2, i.e., the ID16 that is printed on the form being entered. If the user is entering directly onto the screen (not from a hard copy form), the user must provide the ID16. Retain this ID16 throughout Function F3B. Enter onto the DS22 data from P4.
- P6: Locate the DS10 data for the ID16 from P5 or P19. Use this DS10 data throughout Function F3B to provide entries and guidelines for checking (editing) for entries of data from the form; i.e., this DS10 data indicates field locations and data element type editing instructions for the data being entered on the form.
- P7: Locate each of the sets of DS11 data referenced by the forms subpart identifiers (ID17) on the DS10 data from P6. Retain these ID17s throughout Function F3B.
- P8: Begin generating a new set of DS14 data. Use the field format specified by the DS10 data from P6 and the DS11 data sets from P7. Assign the ID18 from P1 and the ID16 from P5 or P19.
- P9: Is the answer retained in P2 (previous DS22 data). A 'Yes'? Yes = P21; No = P10
- P10: Locate the form type code (CT9) and OHMIS service area identifier (ID10) on the DS10 data from P6. Assign these values to the DS22 data from P4 and the DS14 data in P8.
- P11: Locate the length of time that the hard copy of the form is to be maintained from the DS10 data from P6. Add to the DS14 data in P8.
- P12: Generate a data entry screen version of output 012 for the user to enter data from the form. This screen should follow the format of 012 for the DS14 data generated in P8 and include the DS14 data elements completed in P8, P10 (or P21) and P11.

### STEP F3B-1

- P13: Is the answer retained in P2 (previous DS22) a 'Yes'? Yes = P23; No = P14
- P14: Ask user for E3, i.e., the forms units for the form being entered. Note: As with the remaining data entries in F3B, the user enters the data for the hard copy of the completed form onto the portion of the data entry screen that looks exactly like the hard copy form (or fills in the 'blanks' on the screen directly without a hard copy form). At each entry the program checks against the format for the DS14 data generated in P8 to determine if the data has been entered correctly, i.e., the right type and range of values for the data element type given on the DS14 data. Enter E3 onto the DS14 data from P8 and the DS22 data from P4 (or P16).
- P16: Find the DS22 data corresponding to the ID18 from P1.
- P17: Does the DS22 data from P16 indicate that the form being entered is a Missing Data Element Type Form? Yes = P18; No = P19
- P18: GO TO P1 of Step F3B-7.
- P19: Identify the forms specification identifier (ID16) for the form being entered from the DS22 data from P16.
- P20: GO TO P6.
- P21: Copy the CT9, ID10 and forms unit identifiers on the DS22 data from P16 to the DS14 data in P8.
- P22: GO TO P11.
- P23: Ask the user whether the forms unit identifiers shown on the output 012 (obtained from the DS22 data) are all correct. Yes = P15; No = P14

### OUTPUTS AND GENERATION OF DATA SETS:

- 012: OHMIS blank form (generic), screen version, i.e., with the lines about who is supposed to complete the form and review it and the line about who requested the data left off of the output. Screen version has instructions for entering data elements.
- DS14: Completed form data.
- DS22: Outstanding (uncompleted) forms monitoring data.



## STEP F3B-2

Obtain and check the date and person completing the form and the date and person reviewing the form.

PREVIOUS STEP: Step F3B-2 follows P15 of Step F3B-1.

INPUTS (S = Selection; Q = Query (not stored); E = Entry (stored); R = Retrieval):

### Menu Selection and Input Sequence:

- E1: The date that the data on the form was collected (i.e., the date on which the data to fill out the form was obtained; not the date that the form was completed and not the date that it was entered, although these dates could be the same as the date that the data was collected). For some forms, this will include the time that the data was collected as well as the date.
- E2: An employee identifier (ID4) for the person who completed the form being entered.
- E3: Explanation of any difference between the person who was supposed to complete the form being entered (as specified on the DS10 data) and the person who actually did complete the form.
- E4: Employee identifier (ID4) for the person, if any, who reviewed (signed off on) the form being entered.
- E5: Date form was reviewed.
- E6: Explanation of any difference between the person who was supposed to review the completed form (as specified on the DS10 data) and the person who actually did review the form.

### Data Retrievals:

- R1: Completed form identifier (ID18) from P1 of Step F3B-1.
- DS9: Current user/position identity and address data.
- DS10: Forms description data.
- DS14: Completed forms data.
- DS22: Outstanding (uncompleted) forms monitoring data.
- DL8: OHMIS user/position identifier (ID13/ID14) by OHMIS user/position type (CI1/CI2) list.

STEP F3B-2

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

- P1: Locate the DS14 data and the DS22 data from the ID18 from R1. Locate the DS10 data corresponding to the forms specification identifier (ID16) on the DS14 data. Generate the screen version of the output O12 corresponding to the DS14 data.
- P2: Ask user for E1, i.e., data collection date. Enter onto the DS14 data from P1.
- P3: Ask user for E2, i.e., ID4 for the person completing the form. Enter onto the DS14 data from P1.
- P4: Locate the OHMIS user identifier (ID13) or position identifier (ID14), if any, corresponding to the ID4 from P3 using DS9. Enter the ID13/ID14 onto the DS14 data from P1.
- P5: Does the DS10 data from P1 specify a particular type of user/position code (CT1/CT2) for the person who is supposed to complete the specification of the form? Yes = P6; No = P9
- P6: Locate the CT1/CT2 corresponding to the ID13/ID14 from P4, using DL8.
- P7: Does the CT1/CT2 identified in P6 match the CT1/CT2 specified in the DS10 data from P1? Yes = P9; No = P8
- P8: Tell the user that the correct person did not complete the form. Tell user the CT1/CT2 of the person who should have completed the form (from the DS10 data) and who did complete the form (from P6). Ask user for explanation of difference, i.e., E3. Enter answer onto the DS14 data from P1.
- P9: Does the DS10 data specify that the form being entered is to be reviewed? Yes = P10; No = P17
- P10: Ask user for the E4, i.e., the ID4 of the person reviewing the form. Enter onto the DS14 data from P1.
- P11: Locate the ID13/ID14, if any, from the ID4 from P10 using DS9. Enter the ID13/ID14 onto the DS14 data from P1.
- P12: Does the DS10 data from P1 specify a particular type of user/position code (CT1/CT2) that is supposed to review this specification of the form? Yes = P13; No = P16
- P13: Locate the CT1/CT2 corresponding to the ID13/ID14 from P11 using DL8.

STEP F3B-2

- P14: Does the CT1/CT2 identified in P13 match the CT1/CT2 specified in the DS10 data from P1? Yes = P16; No = P15
- P15: Tell user that correct person did not review the form. Tell user the CT1/CT2 of the person who should have reviewed the form (from the DS10 data) and who did review the form (from P13). Ask user for explanation of different, i.e., E6. Enter answer onto the DS14 data from P1.
- P16: Ask user for E5, i.e., date form reviewed.
- P17: GO TO P1 of Step F3B-3.

OUTPUTS AND GENERATION OF DATA SETS:

- O12: OHMIS blank form (generic), screen version, i.e., as described in Step F3B-1.

### STEP F3B-3

Enter the values for the form onto the completed forms data (DS14).  
Generate missing data element type information (DS19) for those data  
element types that were not entered.

PREVIOUS STEP: Step F3B-3 follows P17 of Step F3B-2.

INPUTS (S = Selection; Q = Query (not stored); E = Entry (stored); R  
= Retrieval):

#### Menu Selection and Input Sequence

E1-n Values for each of the data element types on a  
particular form subpart (DS11) for a form, i.e., the  
data being entered onto the OHMIS data base from this  
OHMIS form

#### Data Retrievals:

R1: Completed form identifier (ID18) retained in P2 of  
Step F3B-1

R2: Form subpart identifiers (ID17) that identify the  
data element types on the form being completed. From  
P7 of Step F3B-1.

R3: Current date

R4: Next available missing data element type information  
identifier (ID21)

DS10: Forms description data

DS11: Forms subpart data

DS14: Completed forms data

DL25: Missing data element list

PROCESSING (P = Process substep; FN = For Next (program logic  
loop)):

P1: Locate the DS14 data with the ID18 from R1; locate the  
DS10 data with the ID16 on this DS14 data.

FN1: FOR each ID17 on the list in R2:

P2: Find the corresponding DS11 data. Use this data to  
determine the types of data elements and their editing  
requirements for each data element type being entered from  
the OHMIS form onto the OHMIS data base.

STEP F3B-3

FN1.1: FOR each of the up to 6 data element type codes (CT4) on the DS11 data from P2, i.e., on this iteration of FN1:

Ask the user for E1-n, i.e., the value for the data element type in this iteration of FN1.1.

P4: Did the user provide a value for the E1-n in P3? Yes = P9; No (i.e., does not have the information to complete the entire form) = P5

P5: Generate a new set of DS19 data. Assign the ID21 from R4, the data element type code (CT4) for this iteration of FN1.1, the date from R3, and the ID18 from \$1, i.e., the ID18 for the form from which the value for this data element type is missing. Determine the location in which the value for this data element type will be stored and enter onto the DS19 data. Using the DS10 data from P1, identify which of the up to 9 forms unit identifiers or other data element types on the DS14 data from P1 constitute the up to 6 forms unit identifiers for the subform part (ID17) in this iteration of FN1. Place these forms unit identifiers on the DS19 data.

P6: Add the ID21 assigned to the DS19 data in P5 onto the DL25 list.

P7: Assign a code (e.g., 'Y') to the two fields on the DS14 data on P1 that correspond to the Data Element Sequence Number and baseline information fields for the data element in this iteration of FN1.1. (See DS10 and DS14 for an explanation of these two fields.) This code indicates that there is no Data Element Sequence Number or baseline information for this data element, because no value for the data element type has been entered.

P8: GO TO P10.

P9: Add the value for the data element type entered in P3 to the appropriate field on the DS14 data from P1.

P10: NEXT FN1.1; end of FN1.1, GO TO P11.

P11: NEXT FN1; end of FN1, GO TO P12.

P12: GO TO P1 of Step F3B-4.

OUTPUTS AND GENERATION OF DATA SETS:

DS19: Missing data element information

#### STEP F3B-4

Begin process of assigning Data Element Sequence Numbers and baseline information to each data element on the form that is being entered onto the OHMIS data base. Complete the Data Element Sequence Number/baseline information for data elements that are not entered on the form at this time, for 'one-time' (non-changing) data entries and for 'no baseline information' data entries.

PREVIOUS STEP: Step F3B-4 follows P12 of Step F3B-3.

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

- R1: Completed form identifier (ID18) retained in P1 of Step F3B-1
- R2: Form subpart identifiers (ID17) that identify the data element types on the form being completed. From P7 of Step F3B-1.
- DS11: Forms subpart data
- DS14: Completed forms data

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

- P1: Tell user now beginning process of looking for the Data Element Sequence Number and baseline information for each of the data element types just entered on the form. (See DS10 and DS14 for explanation of the terms 'Data Element Sequence Number' and 'baseline information'.)
- P2: Locate the DS14 data with the ID18 from R1; locate the DS10 data with the ID16 on this DS14 data.
- P3: Using the DS10 data from P2, determine if this is a one-time form. Yes = P4; No = P7
- P4: Assign a code (e.g., 'X') to all unfilled sets of Sequence Number/baseline information fields. This code indicates that the data element type does not have a Sequence Number, because it is a one-time entry (i.e., non-changing data such as a person's date of birth) and that, therefore, this is not the type of information that has a baseline value either.
- P5: Remove the 'Y' code (no data entry) from all Sequence Number and baseline information fields on the DS14 data

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from P2, i.e., change these fields to be blank rather than containing a 'Y'.

P6: GO TO P1 of Step F3B-8.

P7: Make a temporary list, called the P7 list, containing the form subpart identifiers (ID17) on this form (i.e., this DS14 data as identified in P2) that have any data element types that have unfilled Sequence Number/baseline information fields. Use the list from R2 to identify the form subparts on the form that should be reviewed to determine if their Sequence Number/baseline information fields are filled.

FN1: FOR each ID17 on the P7 list:

P8: Locate the DS11 data corresponding to this ID17.

FN1.1: FOR each of the up to 6 data element type codes (CT4) on the DS11 data from P8 (i.e., on this iteration of FN1):

P9: Is the Sequence Number field on the DS14 data from P2 for this data element type filled with a 'Y'? Yes = P12; No = P10

P10: Using the DS11 data for this iteration of FN1, determine if the data element type for this iteration of FN1.1 is a one-time (non-changing) type of data element. Yes = P11; No = P12

P11: Assign and code of 'X' to the Sequence Number and baseline information fields for this data element type on the DS14 data from P2.

P12: NEXT FN1.1; end of FN1.1, GO TO P13.

P13: NEXT FN1; end of FN1, GO TO P14.

P14: Using the DS10 data from P2, determine if this is a 'no baseline information' type of form. Yes = P15; No = P17

P15: Assign a code of 'X' to all unfilled baseline information fields on the DS14 data from P2.

P16: GO TO P24.

P17: Make a temporary list, called the P17 list, containing the form subpart identifiers (ID17) on this form (DS14 data) that have unfilled baseline information fields. Use the list in P7 to generate this list.

FN2: FOR each ID17 on the P17 list:

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P18: Locate the DS11 data corresponding to this ID17.

FN2.1 FOR each of the up to 6 data element type codes (CT4) on the DS11 data from P18 (i.e., on this iteration of FN2):

P19: Is the baseline information field on the DS14 data from P2 for this data element type filled? Yes = P22; No = P20

P20: Using the DS11 data for this iteration of FN2, determine if the data element type of this iteration of FN2.1 is a 'no baseline information' type of data element. Yes = P21; No = P22

P21: Place a code of 'X' to the baseline information field for the data element type in this iteration of FN2.1 on the DS14 data from P2.

P22: NEXT FN2.1; end of FN2.1, GO TO P23.

P23: NEXT FN2; end of FN2, GO TO P24.

P24: GO TO P1 of Step F3B-5.

OUTPUTS AND GENERATION OF DATA SETS: None



### STEP 3B-5

Identify the sequence numbers and base line information for each data element type on the form being entered. The processes in this step are for data element types on forms that have not been previously entered on the OHMIS data base for this form unit(s) (e.g., an employee) before and, therefore, the sequence number, if applicable, is always '1' and the base line information, if applicable, is always '0' (original base line). This Step also includes the processes for assigning sequence numbers and base line information for data element types on a form type and for a form unit for which all past OHMIS forms of this type and for this forms unit have been entered in the correct order, i.e., the forms were entered on the OHMIS data base in the same order as the data on the forms was collected and, therefore, all sequence numbers and base line information for previously entered forms of this type and for this forms unit are correct.

PREVIOUS STEP: Step F3B-5 follows P24 of Step F3B-4.

INPUTS (S = Selection; Q = Query (not stored); E = Entry (stored); R = Retrieval):

#### Menu Selection and Input Sequence:

E1-n: The data element types codes (CT4) on the form that the user wishes to be treated as secondary base line entries.

#### Data Retrievals:

R1: Completed form identifier (ID18) retained in P1 of Step F3B-1.

R2: The list of forms subpart identifiers (ID17) that identify the data element types on the form begin completed for which all of the sequence number and base line information fields are filled. From P7 of Step F3B-4.

DS11: Forms subpart data.

DS14: Completed forms data.

DL23: Current forms list.

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

P1: Locate the DS14 data with the ID18 from R1; locate the DS10 data with the ID16 on this DS14 data.

P2: Make a temporary list, called the P2 list, containing the form subpart identifiers (ID17) on the form being entered

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(i.e., the above DS14 data) that have unfilled sequence numbers. Use the R2 list to generate this list.

P3: Locate the forms unit(s) and the form type (CT9) for the form being entered (from the DS14 data). Retain this information throughout Function F3B. Is there an ID18 on the DL23 for this form type and forms unit(s), i.e., have any previous forms of the same type been entered onto the OHMIS data base for the same forms unit(s) (e.g., for the same employee, facility, etc.)? Yes = P13; No = P4

P4: Add the ID18 from R1 and the form type and forms unit(s) from P3 to the D123 list.

FN1: FOR each ID 17 on the P2 list:

P5: Locate the corresponding DS11 data.

FN1.1: FOR each of the up to 6 data element type codes (CT4) on the DS11 from P5 (i.e., the DS11 for this iteration of FN1):

P6: Is the sequence number on the DS14 data from P1 for this data element type filled? Yes = P10; No = P7

P7: Assign a '1' to the sequence number field for this data element type, i.e., fill the sequence number field for this data element type on the DS14 data from P1 with a '1'.

P8: Is the base line information field for this data element type filled? (Use the DS14 data from P1 to determine this.) Yes = P10; No = P9

P9: Assign a code (e.g., 'the letter O') to the base line information field for this data element type on the DS14 data from P1. The code 'O' means that this data entry constitutes the original base line value for the forms unit(s) and type of form shown on this form (i.e., from the DS14 data from P1 as identified in P3).

P10: NEXT FN1.1; end of FN1.1, GO TO P11.

P11: NEXT FN1; end of FN1, GO TO P12.

P12: GO TO P5 of Step F3B-4.

P13: Start a temporary list, called the P13 list, consisting of pairs of ID18s and dates. Place the ID18 from R1 and the date that the data on this form was obtained (from the DS14 data from P1) at the top (beginning) of this list. (Note: The order in which these pairs of data are added

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to the P13 list is important. Also, if this is the type of form that contains information on the time at which the data on the form was collected (i.e., not just the date, but also the hour, minutes, seconds, etc.) put this time information on the P13 list.

- P14: Locate the previous ID18 on the DL23 list for the ID18 from P1 and the form type/forms unit(s) from P3.
- P15: Locate the DS14 data for the previous ID18 identified in the last step (i.e., identified in either P14 or P18).
- P16: Place the ID18 and the date that the data was obtained for the DS14 data identified in P15 on the bottom (end) of the P13 list.
- P17: Does the DS14 data from P15 contain a previous ID18?  
Yes = P18; No = P19
- P18: Identify the previous ID18 on the DS14 data from P15.  
GO TO P15.
- P19: Are the dates that data was obtained shown on the P13 list without exception in reverse order from latest to earliest date, i.e., as you go down the list does each date get progressively earlier (or remain the same as the date for the previous date on the list)? (Note: If the list contains time information (as well as date information), check that the sets of time information for each date are also in reverse order from latest to earliest time.) Yes (i.e., the forms of this form type and for this forms unit have been entered onto the OHMIS data base in the order that the data on the forms was collected) = P20; No = P57
- P20: Take the previous ID18 on the DL23 identified in P14 and put it in the previous ID18 field on the DS14 data from P1. On the DL23 list replace the previous ID18 identified in P14 with the current ID18 from R1.
- P21: Remove the first (top) ID18 from the P13 list, i.e., the current ID18. The new list is called the P21 list.
- FN2: FOR each ID17 on the P2 list:
- P22: Locate the corresponding DS11 data.
- P23: Is the sequence number field on the DS14 data from P1 for this data element type filled? Yes = P50; No = FN 2.1.1 (P24)

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FN2.1.1: FOR each of the ID18s on the P21 list, i.e., each previous ID18 for this type of form and forms unit(s):

- P24: Locate the DS14 data corresponding to this ID18. Locate the DS10 data corresponding to the forms specification identifier (ID16) on this DS14 data.
- P25: Is the ID16 on the DS14 data for the form being entered (from P1) the same as the ID16 on this previous DS14 data, i.e., the DS14 data from P24 corresponding to the ID18 for this iteration of FN2.1.1? Yes (i.e., it is certain that there is a field for the data element type from this iteration of FN2.1 on the previous DS14 data for this iteration of FN2.1.1, because both forms have the same forms specification) = P26; No = P28
- P26: Using the DS11 data from P22, locate the field for the data element type in this iteration of FN2.1 on the previous DS14 data, i.e., the DS14 data corresponding to the ID18 for this iteration of FN2.1.1.
- P27: GO TO P39.
- P28: Identify each of the ID17s on the DS10 data located in P24 (i.e., the forms subparts in the forms description (DS10) corresponding to the previous set of DS14 data from this iteration of FN2.1.1). Put on a temporary list, called the P28 list.

FN2.1.1.1: FOR each ID17 on the P28 list:

- P29: Locate the DS11 data for this ID17.
- P30: Comparing the information on the DS11 data from P29 with the DS11 from P22, do the 2 sets of forms subpart data both refer to the same exact form unit (or combination of forms units) on their respected DS14 data? Yes = P31; No = P38
- P31: Is the ID17 for this iteration of FN2.1.1.1 the same as the ID17 for this iteration of FN2? Yes (i.e., it is certain that there is a field for the data element type for this iteration of FN2.1 on the previous DS14 data for this iteration of FN2.1.1) = P32; No = FN2.1.1.1.1 (P34)
- P32: Using the DS11 data from P29, locate the field for the data element type in this iteration of FN2.1 on this previous DS14 data, i.e., the DS14 data corresponding to the ID18 for this iteration of FN2.1.1.
- P33: GO TO P39.

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FN2.1.1.1.1: FOR each of the up to 6 data element types on the DS14 data from P29 (i.e., for this iteration of FN2.1.1.1):

P34: Is this the same data element type as the data element type in this iteration of FN2.1? Yes (i.e., it is certain that there is a field for the data element type for this iteration of FN2.1 on the previous DS14 data for this iteration of FN2.1.1) = P35; No = P37

P35: Locate the field for the data element type in this iteration of FN2.1 for this previous DS14 data (the DS14 data corresponding to the ID18 in this iteration of FN2.1.1), i.e., locate the field in which the data element type in this iteration of FN2.1.1.1.1 was reached.

P37: NEXT FN2.1.1.1.1; end of FN2.1.1.1.1, GO TO P38.

P38: NEXT FN2.1.1.1; END OF FN2.1.1.1, GO TO P46.

P39: Flag the field on the previous DS14 data (i.e., the DS14 data corresponding to the ID18 for this iteration of FN2.1.1) that is the space for the data element type in this iteration of FN2.1, i.e., flag the field identified in P26 or in P32 or in P35.

P40: Is there a value entered on the previous DS14 data from P24 in the field flagged in P39? Yes = P41; No = P46

P41: Locate the sequence number from the data element type flagged in P39 (in the sequence number field for this data element type on the DS14 data from P24). Add '1' to this sequence number. Place this new sequence number on the DS14 data from P1 as the sequence number of the data element type in this iteration of FN2.1

P42: Is the base line information field for the data element type in this iteration of FN2.1 a 'no base line information' type of data element type, i.e., is the base line information field for this data element type on the DS14 data from P1 already filled with an 'X'? Yes = P50; No = P43

P43: Assign a code (e.g., 'N') to the base line information field on the DS14 data from P1 for the data element type for this iteration of FN2.1. The 'N' indicates that this value for the data element type is not a base line value.

P44: (Skip this process substep)

P45: GO TO P50.

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- P46: NEXT FN2.1; end of FN2.1.1, GO TO P47.
- P47: Place the sequence number '1' in the sequence number field for the data element type in this iteration of FN2.1, i.e., on the DS14 data from P1.
- P48: Is the baseline information field for the data element type in this iteration of FN2.1 a 'no base line information' type of data element, i.e., is the base line information field for this data element type on the DS14 data from P1 already filled with an 'X'? Yes = P50; No = P49
- P49: Assign the code '0' (original base line) to the base line information field on the DS14 data from P1 for the data element type in this iteration of FN2.1.
- P50: NEXT FN2.1; end of FN2.1, GO TO P51.
- P51: NEXT FN2; end of FN2, GO TO P52.
- P52: Review each of the base line information fields on the DS14 data from P1. If the base line information field is filled with an 'N' (not a base line entry), put the data element type code (CT4) corresponding to this field on a temporary list, called the P52 list.
- P53: Are there any data element type codes (CT4) on the P52 list? Yes = P54; No = P56
- P54: Ask user if s/he wishes to identify any of the data element type codes on the form just entered as 'secondary base line' information, i.e., as entries that are not the first entry of the data element type for this forms unit on the OHMIS data base (i.e., not the original base line entry), but are nevertheless to be treated as base line information. Yes = P55; No = P56
- P55: Print out the list of data element type codes (CT4) and their corresponding meaning (from the OHMIS vocabulary word/phrase data base) that are on the P52 list. Ask the user to identify which are to be treated as secondary base line entries, i.e., ask the user for E1-n. The user may enter the word 'ALL'. For each data element type that the user has identified as a secondary base line entry, replace the 'N' in the base line information field for the data element type with a code, e.g., 'S', to indicate this.
- P56: GO TO P5 of Step F3B-4.

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P57: GO TO P1 of Step F3B-6.

OUTPUTS AND GENERATION OF DATA SETS: None

## STEP F3B-6

Identify the sequence number and baseline information for each data element type on the form being entered (and for all previous entries of the same data element typed), when the form being entered contains data that is not the most recently obtained, i.e., when the forms of this form type and for this forms unit(s) (e.g., employee) have been entered onto the OHMIS data base out of date order. When the forms of a given type and for a given forms unit are entered onto the OHMIS data base out of order (i.e., not in the order that the data was obtained), it is possible that the sequence numbers and the baseline information on the data element types for all previously entered forms are of this type and for this forms unit are also out of order. Therefore, this step puts the forms in proper order and then reviews all previously entered forms of the same type and forms unit and makes corrections in the sequence number and baseline information.

It should be noted that this same process (i.e., Step 6 of Function 3B) of reordering the forms (i.e., reassigning previous completed form identifiers (ID 18)) and reassigning sequence numbers is required whenever an entire set of completed forms data (DS14) is deleted by the user (Menu Selection Sequence 3.2), unless the form being deleted is a one-time form.

PREVIOUS STEP: Step F3B-6 follows P57 of Step F3B-5.

INPUTS (R - Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

- R1: Completed form identifier (ID18) retained in P1 of Step F3B-1.
- R2: The temporary list consisting of the pairs of ID18s and dates (and possibly time information, i.e., hour, minute, second) for the form (ID18) which is being entered and for all previous forms that have been entered on the OHMIS data base for this form type (CT9) and forms unit(s), e.g., employee. From the P13 list from Step F3B-5.
- R3: The temporary list of forms subpart identifiers (ID17) on the form being entered (i.e., the DS14 data for the ID18 from R1) that have unfilled sequence numbers. From the P2 list from Step F3B-5.
- R4: The form type (CT9) and forms unit(s) for the type of form being entered. Retained in P3 of Step F3B-5.
- DS10: Forms description data.
- DS11: Forms subpart data.



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DS14: Completed forms data.

DL23: Current forms list.

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

- P1: Put the pairs of ID18s and dates from R2 in ascending order by date, i.e., so that each date is equal to or later than the previous date. (If the list contains hours, minutes, seconds, etc., put the ID18s in ascending order within each date by these hours, minutes, seconds, etc.) This temporary list is called the P1 list.
- P2: Identify the first ID18 on the P1 list, i.e., the ID18 with the earliest date. Locate the DS14 data that corresponds to this ID18.
- P3: Change the previous ID18 on the set of DS14 data from P2 (i.e., not the ID18 that identifies this set of DS14 data) to read as a blank, i.e., there is no previous ID18.
- P4: Remove the first ID18 from the P1 list. This is now a new list called the P4 list. (Do not erase the P2 list.)
- P5: Identify the last (latest) ID18 on the P2 list. Replace the ID18 on the DL23 list (i.e., the ID18 for the latest form for the type of form (CT9) and forms unit(s) being entered as identified in R4) with this last ID18 on the P2 list.

FN1: FOR each ID18 on the P4 list:

- P6: Locate the DS14 data corresponding to this ID18.
- P7: Identify the ID18 on the P4 list that immediately precedes the ID18 for this iteration of FN1.
- P8: Replace the previous ID18 on the DS14 data identified in P6 (i.e., not the ID18 that identifies this set of DS14 data) with the ID18 identified in P7.

P9: NEXT FN1; end of FN1, erase the P4 list and GO TO P10.

P10: Locate the DS14 data with the ID18 from R1; locate the DS10 data with the forms specification identifier (ID16) on this DS14 data.

FN2: FOR each ID17 on the R3 list, i.e., each form subpart on the form being entered for which there are unfilled sequence numbers:

STEP F3B-6

P11: Locate the DS11 data for this ID17.

FN2.1: FOR each of the up to six data element type codes (CT4)  
on the DS11 data for P11 (i.e., this iteration from FN1):

P12: Store the value '1'.

FN2.1.1: FOR each of the ID18s on the P2 list:

P13: Is this ID18 (i.e., the one for this iteration of FN2.1.1)  
the same as the ID18 from R1, i.e., the ID18 for the new  
form being entered? Yes = P14; No = P22

P14: Locate the field on the DS14 data from P10 containing the  
data element type in this iteration of FN2.1. Place the  
value in P12 in the sequence number field for this data  
element type.

P15: Add '1' to the value in P2.

P16: Is the baseline information field for the data element  
type code for this iteration of FN2.1 (as identified in  
P14) filled with an 'X' (not baseline type of  
information)? Yes = P46; No = P17

P17: Was the sequence number added for this data element type  
in P14 a '1'? Yes = P18; No = P20

P18: Place an 'O' (original baseline) in the baseline  
information field for this data element type.

P19: GO TO P46.

P20: Place a 'N' (not a baseline entry) in the baseline  
information field for this data element type.

P21: GO TO P46.

P22: Locate the DS14 data corresponding to the ID18 for this  
iteration of FN2.1.1. Locate the DS10 data corresponding  
to the forms specification identifier (ID16) on this DS14  
data.

P23: Is the ID16 on the DS14 data for the form being entered  
(from P10) the same as the ID16 on the DS14 data located  
in P22, i.e., the DS14 data for this iteration of FN2.1.1?  
Yes (i.e., it is certain that there is a field for the  
data element type in this iteration of FN2.1 on the form  
(DS14 data) for this iteration of FN2.1.1) = P24; No = P26

P24: Using the DS11 data from P11, locate the field for the  
data element type in this iteration of FN2.1.

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P25: GO TO P37.

P26: Identify each of the ID17s on the DS10 data located in P22 (i.e., the forms subpart in the form specification corresponding to the set of DS14 data in this iteration of FN2.1.1). Put on a temporary list called the P26 list.

FN2.1.1.1: FOR each ID17 on the P26 list:

P27: Locate the DS11 data for this ID17.

P28: Comparing the information on the DS11 data from P27 with the DS11 data from P11, do the two sets of forms subpart data both refer to the same exact forms unit (or combination of forms units) on their respective DS14 data? Yes = P29; No = P36

P29: Is the ID17 for this iteration of FN2.1.1.1 the same as the ID17 for this iteration of FN2? Yes (i.e., it is certain that there is a field for the data element type for this iteration of FN2.1 on the DS14 data for this iteration of FN2.1.1) = P30; No = FN2.1.1.1.1 (P32)

P30: Using the DS11 data from P27, locate the field for the data element type in this iteration of FN2.1 on the DS14 data corresponding to the ID18 for this iteration of FN2.1.1.

P31: GO TO P37.

FN2.1.1.1.1: FOR each of the up to six data element types on the DS11 data from P27 (i.e., for this iteration of FN2.1.1.1):

P32: Is this the same data element type as the data element type in this iteration of FN2.1? Yes (i.e., it is certain that there is a field for the data element type in this iteration of FN2.1 on the DS14 data for this iteration of FN2.1.1) = P33; No = P35

P33: Locate the field for the data element type in this iteration of FN2.1 for the DS14 data from this iteration of FN2.1.1, i.e., locate the field in which the data element type in this iteration of FN2.1.1.1.1 was reached.

P34: GO TO P37.

P35: NEXT FN2.1.1.1; end of FN2.1.1.1.1, GO TO P36.

P36: NEXT FN2.1.1.1; end of FN2.1.1.1, GO TO P46.

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- P37: Flag the field on the DS14 data for this iteration of FN2.1.1 that is the space for the data element type in this iteration of FN2.1, i.e., flag the field identified in P24, P30, or P33.
- P38: Is there a value entered on the DS14 data for this iteration of FN2.1.1 (i.e., the DS14 data located in P22) in the field flagged in P37, i.e., does this form contain any value for the data element type in this iteration of FN2.1? Yes = P39; No = P46
- P39: Place the value in P12 as the new sequence number for the data element type in this iteration of FN2.1 on the form (DS14 data) for this iteration of FN2.1.1, i.e., the sequence number for the data element type flagged in P37.
- P40: Add the '1' to the value stored in P12.
- P41: Is the baseline information field for the data element type flagged in P37 (i.e., the data element type for this iteration of FN2.1 as it is located on the form (DS14 data) for this iteration of FN2.1.1) a 'no baseline information' type of data element type, i.e., is this field filled with an 'X'? Yes = P47; No = P42
- P42: Was the sequence number added for this data element type in P39 a '1'? Yes = P43; No = P45
- P43: Place an '0' (original baseline) in the baseline information field for this data element type.
- P44: GO TO P46.
- P45: Place a 'N' (not a baseline entry) in the baseline information field for this data element type.
- P46: NEXT FN2.1.1; end of FN2.1.1, GO TO P47.
- P47: NEXT FN2.1; end of FN2.1, GO TO P48.
- P48: NEXT FN2; end of FN2, GO TO P49.
- P49: GO TO P52 of Step F3B-5.

OUTPUTS AND GENERATION SETS: None

### STEP 3B-7

Identify the sequence numbers and baseline information for each missing data element type on the form being entered (and for all previous and subsequent entries of the same data element type), when the form being entered is a Missing Data Element Type Form.

The data element type that is missing from an OHMIS form is a data element type for which the value for the data element type was not entered on the OHMIS data base at the time that the form containing the data element type was entered onto the OHMIS data base. When entering these missing data elements the sequence number for the value for the data element type depends on what the sequence number for that data element type was on the form previously entered containing that data element type that was for the same form type and for the same forms unit(s) (e.g., employee) as the form on to which the missing data element type is being entered. Therefore, to locate the sequence number and baseline information for a missing data element type it is necessary to search through the previously entered data for the same forms type/forms unit. This is similar to the process of assigning sequence numbers to new (not previously missing) data element type. However, for entries of missing data element types there may also have been subsequent entries of data onto the OHMIS data base, i.e., after the form containing the field for the missing data element type was entered, as well as previous entries. This means that the process of assigning sequence numbers/baseline information for missing data element types includes a revision of all of the sequence numbers and baseline information fields for the same missing data element type on those forms for the same forms type/forms unit(s) entered after the form containing the field for the missing data element type was entered.

The process described here for entering missing data element types from a Missing Data Element Type Form is the same as that required when adding an individual missing data element type, i.e., Menu Selection Sequence 3.5, except that that process is only to enter one missing data element type (equivalent to one iteration of FN1, i.e., one missing data element information identifier (ID21)) on a completed form data set (DS14) identified by the user.

Similarly, if the user elects to change a value for a previously entered form by deleting the value, that part of the process of assigning sequence numbers to missing data element types that involves revising the subsequent entries of this data element type (i.e., the process beginning with P60 in Step F3B-7) must be conducted. (Changes to previously entered data on an OHMIS form are made using Menu Selection Sequence 3.3.)

PREVIOUS STEP: Step F3B-7 follows P13 of Step F3B-1.

INPUTS (S = Selections; Q = Query (not stored); E = Entry (stored); R = Retrieval):

Menu Selection and Input Sequence:

### STEP 3B-7

E1-n: Values for each of the data element types on the particular Missing Data Element Form being entered on to the OHMIS data base

#### Data Retrievals:

R1: Completed form identifier (ID18) retained in P1 of Step F3B-1, i.e., for the form being entered in this execution of Function 3B

DS10: Forms description data

DS11: Forms subpart data

DS14: Completed form data

DS19: Missing data element information

DS22: Outstanding (uncompleted) forms monitoring data

DL23: Current forms list

DL25: Missing data element list

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

P1: Locate the DS22 data corresponding to the ID18 from R1.

FN1: FOR each of the missing data element type information identifiers (ID21) on the DS22 data from P1:

P2: Locate the DS19 data corresponding to the ID21. Use this data to identify the data element type that is missing and is to have been entered on the Missing Data Element Type Form being entered in this execution of F3B; also use this DS19 data to conduct the edits on the entries for the values of the data element type entered during F3B and to determine the location where the entries are to be stored (using the forms description data (DS10) and the forms subpart data (DS11) referenced in the DS19 data).

P3: Ask the user for E1-n, i.e., value for the data element type that is on the DS19 data for this iteration of FN1 (i.e., the data element type corresponding to this ID21). In other words, ask the user to enter one of the values on the completed Missing Data Element Type Form.

P4: Did the user provide a value for E1-n in P3 that passed the edits checks? Yes = P7; No = P5

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- P5: Erase the ID18 from R1 for the DS19 data located in P2 (i.e., the ID18 indicating on which Missing Data Element Type Form the value for the missing data element type on this DS19 data is to be collected). Do not erase the entire DS19 data. (Note: By removing the ID18 from the DS19 data, the data base indicates that this missing data element type is no longer being collected on a Missing Data Element Type Form and can, therefore, be put on any new Missing Data Element Type Form that is generated in F3A.) Also, erase the ID21 for this iteration of FN1 from the DS22 data located in P1, but do not erase the entire DS22 data. (Note: This is done in order to stop the program from attempting to evaluate allowable limits for this missing data element type; no allowable limits evaluations should be conducted at this time for this missing data element type because the value for the missing data element type was not entered.)
- P6: GO TO P93.
- P7: Does the DS19 data from P2 indicate that the data element type being entered (i.e., the data element type covered by the data from P2) is to be stored on the OHMIS data base in the same way that data from OHMIS forms are stored, i.e., is the missing data element type missing from a partially completed OHMIS form rather than missing from data entered from an External Data Source? The determination of whether the missing data element type is missing from an OHMIS form is shown by whether or not there is a completed form identifier (ID18) on the DS19 data for the missing data element type indicating from what previously partially completed form (DS14 data) the data element type being entered is missing. Yes = P12; No = P8
- P8: Use the DS19 data from P2 to determine the storage location of the data element type covered by the DS19 data for this iteration of FN1.
- P9: Store the E1-n value entered in P3 on the OHMIS data base in the location determined in P8.
- P10: Erase the ID21 from this iteration of FN1 from the DL25 list. Erase the entire DS19 data located in P2. Erase the ID21 from this iteration of FN1 from the DS22 data from P1 (Note: The ID21 is erased from the DS22 data in order to stop and allow the limits evaluation for this data element type; only data element types entered and stored on OHMIS forms are given an automatic allowable limits evaluation.)

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- P11: GO TO P93.
- P12: Determine where the value for the data element type entered in P3 (i.e., E1-n) is to be stored. To do this, use the DS19 data from P2 (i.e., the DS19 data for the missing data element type being entered) to identify the completed form identifier (ID18) and the forms subpart identifier (ID17) that indicate where (on what completed form data (DS14)) the data element type is to be stored. Then locate the DS10 data that corresponds to the forms specification identifier (ID16) on this DS14 data. This DS10 data describes the format of the form onto which the missing data element type is to be entered and gives the location of the forms subpart on the form. Then review the DS11 data for the forms subpart identifier (ID17) on which the missing data element type is stored to locate the particular field (the particular data element type in this forms subpart) in which the missing data element type is to be stored.
- P13: Enter the value for the missing data element type (i.e., E1-n) onto the DS14 data identified in P4.
- P14: Tell the user that the program is now looking for the Data Element Sequence Numbers and baseline information for the missing data element type just entered.
- P15: Use the DS10 data identified in P12, i.e., the DS10 data that gives the forms specification (format) for the completed form data (DS14) onto which the missing data element type has been entered, determine whether this is a one-time form (i.e., all data element types on this form are non-changing data element types). Yes = P16; No = P18
- P16: Place an 'X' (not a multiple entry and therefore no sequence number or baseline information is needed) in both the sequence number and baseline information field on the DS14 data identified in P12 for the data element type corresponding to the missing data element type entered in P3, i.e., the missing data element for this iteration of FN1.
- P17: GO TO P93.
- P18: Using the DS10 data identified in P12, determine if this is a 'no baseline information' form, i.e., none of the data element types on the DS14 data containing the missing data element type for this iteration of FN1 have baseline information. Yes = P19; No = P20



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- P19: Place an 'X' (no baseline information) in the baseline information field on the DS14 data identified in P12 for the data element type corresponding to the missing data element type entered in P3, i.e., from this iteration of FN1.
- P20: Identify the DS11 data from the forms subpart (ID17) that was determined in P12 to be the storage location of the missing data element type being entered.
- P21: Using the DS11 data from P15, determine if the missing data element type is a non-changing data element type.  
Yes = P16; No = P22
- P22: Examine the DS14 data identified in P12, i.e., the completed form data that contains the missing data element type being entered. Does this DS14 data contain a previous ID18, i.e., the ID18 identifying the previous set of DS14 data that is for the same forms type and forms unit(s)? (This is not the same as the ID18 that identifies the DS14 data from P12.) Yes = P29; No = P23
- P23: Assign the missing data element type for this iteration of FN1 the sequence number of '1'. Store this sequence number in the sequence number field for the missing data element type for which the storage location was identified in P12.
- P24: Using the DS11 data from P15 (i.e., the DS11 data corresponding to the missing data element type being entered), determine if the data element type has baseline information. Yes = P25; No = P27
- P25: Assign the code '0' (original baseline) to the baseline information field for the missing data element type. This field corresponds to the field for the missing data element type identified in P12.
- P26: GO TO P60.
- P27: Assign the code 'X' (data element type is not a baseline type of data) to the baseline information field for the missing data element type.
- P28: GO TO P60.
- P29: Identify this previous ID18 on the DS14 data located in P12.
- P30: Put the ID18 from P29 at the top of (first on) a temporary list, called the P30 list. The order of the ID18s on this list is important.

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- P31: Locate the DS14 data from the ID18 that was last entered (entered at the bottom of) the P30 list. Locate the DS10 data from the forms specification identifier (ID16) on this DS14 data.
- P32: Does the DS14 data from P31 contain a previous ID18 (not the ID18 that identifies this set of DS14 data)? Yes = P33; No = FN1.1 (P35)
- P33: Identify this previous ID18 and put it at the bottom (end) of the P30 list.
- P34: GO TO P31.

FN1.1: FOR each ID18 on the P30 list:

- P35: Locate the DS14 data for this ID18. Locate the DS10 data for the ID16 that is on this DS14 data.
- P36: Is the ID16 for the DS10 data located in P35 the same as the ID16 from the DS10 data identified in P12, i.e., does this previous DS14 data have the same form specification as the form onto which the missing data element type was entered? Yes (i.e., it is certain that there is a field for the missing data element type for this iteration of FN1 on the previous DS14 data for this iteration of FN1.1) = P37; No = P39
- P37: Using the DS11 data from P20, locate the field for the missing data element type in this iteration of FN1.
- P38: GO TO P50.
- P39: Identify each of the ID17s on the DS10 data located in P35 (i.e., the forms subpart in the forms specification corresponding to the previous set of DS14 data for this iteration of FN1.1). Put on a temporary list called the P39 list.

FN1.1.1: FOR each ID17 on the P39 list:

- P40: Locate the DS11 data for this ID17.
- P41: Comparing the information on the DS11 data from P40 with the DS11 data from P20, did the two sets of forms subpart data both refer to the same exact forms unit (or combination of forms units) on their respective DS14 data? Yes = P42; No = P49
- P42: Is the ID17 for this iteration of FN1.1.1 (as identified in P40) the same as the ID17 for the DS11 data identified

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in P20, i.e., the same as the forms subpart in which the missing data element type is stored? Yes (i.e., it is certain that there is a field for the missing data element type from this iteration from FN1 on the previous DS14 data from this iteration of FN1.1) = P43; No = FN1.1.1.1 (P45)

P43: Using the DS11 data from P40, locate the field for the data element type in this iteration of FN1 on this previous DS14 data, i.e., the DS14 data corresponding to the ID18 for this iteration of FN1.1.

P44: GO TO P50.

FN1.1.1.1: FOR each of the up to six data element types on the DS11 data from P40 (i.e., for this iteration of FN1.1.1):

P45: Is this the same data element type as the missing data element type in this iteration of FN1? Yes (i.e., it is certain that there is a field for the missing data element type for this iteration of FN1 on the previous DS14 data for this iteration of FN1.1) = P46; No = P48

P46: Locate the field for the data element type in this iteration of FN1 for this DS14 data (the DS14 data corresponding to this iteration of FN1.1), i.e., the field in which the data element type in this iteration of FN1.1.1.1 was reached.

P47: GO TO P50.

P48: NEXT FN1.1.1.1; end of FN1.1.1.1, GO TO P49.

P49: NEXT FN1.1.1; end of FN1.1.1, GO TO P59.

P50: Flag the field on the previous DS14 data (i.e., the DS14 data corresponding to the ID18 for this iteration of FN1.1) that is the space for the data element typed in this iteration of FN1, i.e., flag the field identified in P37, P43, or P46.

P51: Is there a value entered on the previous DS14 data from P35 in the field flagged in P50? Yes = P52; No = P59

P52: Locate the Data Element Sequence Number for the data element type flagged in P39 (in the sequence number field for this data element type on the DS14 data from P24). Add '1' to the value of this Data Element Sequence Number. Place this new Data Element Sequence Number on the DS14 data from P12 (i.e., the DS14 data onto which the missing data element type was entered) for the Data Element Type Sequence Number of the data element type in this iteration

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of FN1. Retain this sequence number throughout this iteration of FN1.

- P53: Is the baseline information field for the missing data element type on the DS14 data from this iteration of FN1.1 a 'no baseline information' type of data element type, i.e., is the baseline information field for this data element type on the DS14 data from P12 already filled with an 'X'? Yes = P60; No = P54
- P54: Ask the user whether the missing data element type just entered is to be a 'secondary baseline' entry. Yes = P55; No = P57
- P55: Assign a 'S' (secondary baseline entry) to the baseline information field for the missing data element typed in this iteration of FN1, i.e., on the baseline information field on the DS14 data for this data element type located in P12.
- P56: GO TO P60.
- P57: Assign a 'N' (not a baseline entry) to the baseline information field for the missing data element type in this iteration of FN1, i.e., on the baseline information field on the DS14 data for this data element type located in P12.
- P58: GO TO P60.
- P59: NEXT FN1; end of FN1.1, GO TO P23.
- P60: Locate the form unit(s) and the form type (CT9) for the form (DS14 data) onto which the missing data element type was entered (i.e., this information is on the DS14 data identified in P12. Retain this information throughout this iteration of FN1.
- P61: Is the ID18 from P12 (i.e., the ID18 for the completed form data (DS14) onto which the missing data element type has been entered/stored) the same as the ID18 on the DL23 list for the form unit(s)/form type identified in P60? That is, is the form onto which the missing data element type was entered/stored the latest form entered onto the OHMIS data base (i.e., the form containing the most recently collected data) for this type of form and for this forms unit(s)? Yes = P93; No (i.e., it is necessary to check and possibly change the Data Element Sequence Number and baseline information fields on the data element types entered subsequent to the missing data element type) = P62

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- P62: Using the DL23 list, identify the latest ID18 for the forms unit(s)/forms type identified in P60.
- P63: Put the ID18 from P62 on the top of (first on) a temporary list called the P63 list. The order of the ID18s on the P63 list is important.
- P64: Locate the DS14 data for the ID18 last entered on (entered at the bottom of) the P63 list.
- P65: Locate the previous ID18 on the DS14 data located in P64 (not the one identifying the set of DS14 data).
- P66: Is the ID18 located in P65 the same as the ID18 from P12, i.e., is this form onto which the missing data element type was entered? Yes = P69; No = P67
- P67: Put the ID18 from P65 at the bottom (end) of the P63 list.
- P68: GO TO P64.
- P69: Reverse the order of the ID18s on the P63 list, i.e., put them in order of increasingly later dates of the date on which the data on the form was obtained, starting with the form after the form onto which the missing data element type for this iteration of FN1 was entered. This is called the P69 list and the ID18s on this list are referred to as the subsequent ID18s, because the DS14 data corresponding to these ID18s was obtained subsequent to the date that the data on the form for which the missing data element was entered was obtained.
- P70: Store the Data Element Sequence Number entered for the missing data element type being entered in this iteration of FN1. (This value is obtained from P52.)

FN1.2: FOR each ID18 on the P69 list:

- P71: Locate the DS14 data for this ID18. Locate the DS10 data corresponding to the forms specification identifier on this DS14 data.
- P72: Is the ID16 on the DS14 data from P12 (i.e., the form onto which the missing data element type was entered) the same as the ID16 identified in P71, i.e., the same as the ID16 on the subsequent DS14 data (for this iteration of FN1.2)? Yes (i.e., it is certain that there is a field for a data element that is the same as the missing data element type for this iteration of FN1 on the subsequent DS14 data for this iteration of FN1.2) = P73; No = P75

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- P73: Using the DS11 data from P71, locate the field for the data element type in this iteration of FN1.
- P74: GO TO P86.
- P75: Identify each of the ID17s on the DS10 data located in P71 (i.e., the forms subpart in the forms specification (DS10) corresponding to the subsequent DS14 data for this iteration of FN1.2.) Put on a temporary list called P75 list.

FN1.2.1: FOR each ID17 on the P75 list:

- P76: Locate the DS11 data for this ID17.
- P77: Comparing the information on the DS11 data from P20 (i.e., the forms subpart where the missing data element for this iteration of FN1 was entered) with the DS11 data from P76, do the two sets of forms subpart data both refer to the same exact forms unit (or combination of forms units) on their respective DS14 data? Yes = P78; No = P85
- P78: Is the ID17 for this iteration of FN1.2.1 the same as the ID17 for P12 (i.e., the ID17 for the forms subpart on which the missing data element type in this iteration of FN1 was stored)? Yes (i.e., it is certain that there is a field for the data element type for this iteration of FN1 on the subsequent DS14 data for this iteration of FN1.2.1) = P79; No = FN1.2.1.1 (P81)
- P79: Using the DS11 data from P76, locate the field for the missing data element type in this iteration of FN1 on this subsequent DS14 data, i.e., on the DS14 data corresponding to the ID18 for this iteration of FN1.2.
- P80: GO TO P80.

FN1.2.1.1: FOR each of the up to six data element types on the DS11 data from P76 (i.e., for this iteration of FN1.2.1):

- P81: Is this the same data element type as the missing data element type in this iteration of FN1? Yes (i.e., it is certain that there is a field for the missing data element type for this iteration for FN1 on the subsequent DS14 data for this iteration of FN1.2) = P82; No = P84
- P82: Locate the field for the missing data element typed in this iteration of FN1 for this subsequent DS14 data (the DS14 data corresponding to the ID18 in this iteration of FN1.2), i.e., the field in which the data element type in this iteration of FN1.2.1.1 was reached.

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P83: GO TO P86.

P84: NEXT FN1.2.1.1; end of FN1.2.1.1, GO TO P85.

P85: NEXT FN1.2.1; end of FN1.2.1, GO TO P92.

P86: Flag the field on the subsequent DS14 data (i.e., the DS14 data corresponding to the I018 for this iteration of FN1.2) that is the space for the same data element type as the missing data element type in this iteration of FN1, i.e., the flag the field identified in P74, P79, or P82.

P87: Is there a value entered on the subsequent DS14 data from P71 in the field flagged in P86? Yes = P86; No = P92

P88: Add '1' to the Data Element Sequence Number value stored in P70.

P89: Assign the Data Element Sequence Number stored in P70 to the sequence number field on the subsequent DS14 data for this iteration of FN1.2 for the data element typed in this iteration of FN1, i.e., to the Data Element Sequence Number field for the data element type whose location was flagged in P86.

P90: Identify the baseline information field for the data element type in this iteration of FN1 on this subsequent DS14 data (i.e., the baseline information field corresponding to the field on the DS14 data located in P71 for the data element type whose field was flagged in P86). Does this field contain a '0' (original baseline)? Yes = P91; No = P92

P91: Change the baseline information field identified in P90 to read 'N' (not a baseline entry).

P92: NEXT FN1.2; end of FN1.2, GO TO P93.

P93: NEXT FN1; end of FN1, GO TO P94.

P94: GO TO P1 of Step F3B-14.

OUTPUTS AND GENERATIONS OF DATA SETS: None

### STEP 3B-8

This step begins the process of evaluating allowable limits for the data being entered in this execution of Function F3B.

In this step, the program determines whether there are any allowable limits specifications for the forms specification being entered in this execution of Function F3B that apply to the form-as-a-whole. If there are, the program determines whether there is a default allowable limit for this specification.

In OHMIS allowable limits (or unallowable limits) can be set for a given data element type (e.g., a single medical test result for a given employee) or for entering an entire class or set of data elements such as data on a hazardous substance spill or other incident. Classes of data are identified by the forms specification (ID16) of the form from which the class of data is entered; that is, the user is said to be entering an entire class of data when he/she enters data from a specification of a form of the type that covers that type of data. For example, when entering data onto the OHMIS data base from a form such as a report used to record hazardous substance spills, the user is said to be entering data on the hazardous substance spill class of data. In Step F3B-8, the program checks to determine if there are any allowable limits for entering the class of data (i.e., the data for the particular form type (CT9) and version (ID16)) being entered in this execution of Function F3B. For example, there may be an allowable limit on how many hazardous spills can take place for a given facility before a given requirement (action) must be initiated. This type of allowable limit would be shown in the form of the number of forms of the type covering hazardous substance spills coming from a given facility within a given time span before a requirement should be triggered.

Some allowable limits apply only in a given circumstance; in the above example, an allowable limit might be specified for hazardous spills in only certain facilities. Other allowable limits have no applicability specifications, i.e., they apply in all circumstances. These are called the default allowable limits. Step F3B-8 determines whether the allowable limit for the forms specification being entered is a default allowable limit.

PREVIOUS STEP: Step F3B-8 follows P6 of Step F3B-4.

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

R1: Completed form identifier (ID18) retained in R1 in Step F3B-1, i.e., the ID18 of the form being entered in this execution of Function F3B.



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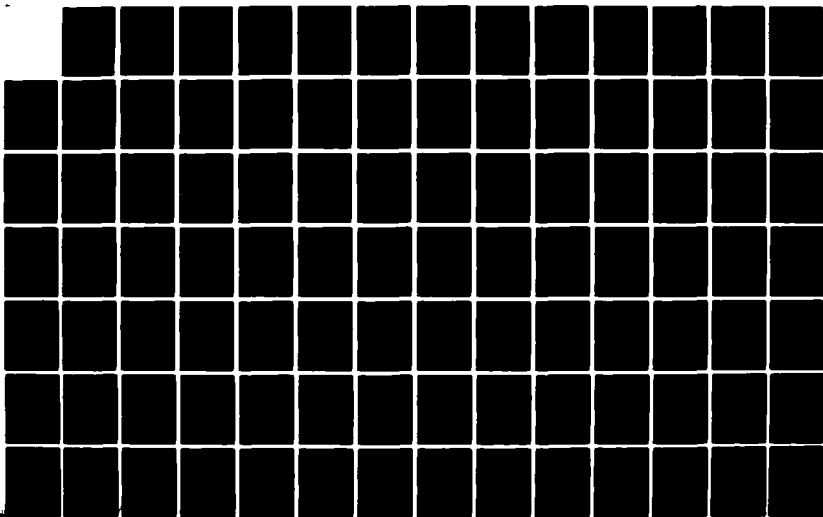
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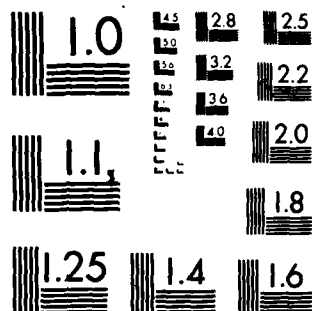
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STEP 3B-8

- R2: Next available allowable limits check request identifier (ID22)
- R3: Current date
- DS14: Completed forms data
- DS17: Allowable limits specification data
- DL17: List of allowable limits check request identifiers (ID22) by completed form identifier (ID18) and by OHMIS service area (ID10)
- DL29: List of active (allowable limits specification) requirement application identifiers (ID5) by forms specification identifier (ID16) and OHMIS service area (ID10)
- DL30: List of active default (allowable limits specification) requirement application identifiers (ID5) by forms specification identifier (ID16) and OHMIS service area (ID10)

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

- P1: Tell user that the process of evaluating allowable limits for the data on the form just entered is now just beginning. Locate the DS14 data for the ID18 from R1. Locate the DS10 data corresponding to the forms specification identifier (ID16) on this DS14 data. Also, locate the OHMIS service area identifier (ID10) and the previous ID18, if any, that on this DS14 data.
- P2: Using DL29, determine whether there are any allowable limits specification data (DS17) for the ID16 and ID10 identified in P1, i.e., whether there are any allowable limits set for entering this type of form-as-a-whole. That is, determine whether are any allowable limits for entering the class of data identified by the forms specification (ID16) for the form being entered in this execution of Function F3B. Yes = P4; No = P3
- P3: GO TO P1 Step F3B-11.
- P4: Begin generating a set of DS18 data for the form-as-a-whole. Assign the ID22 from R2; the ID10 identified in P1; the date from R3; the ID18 from R1 as the first ID18, i.e., the ID18 identifying the DS14 data from P1 as the form being entered in this execution of Function F3B; and, the ID18 from the previous set of DS14 data, if any, from P1. Identify this set of DS18

STEP 3B-8

data as a forms-as-a-whole type of allowable limits evaluation (i.e., assign the answer of '2'). Assign the ID16 from P1 to this DS18 data and leave the forms subpart identifier (ID17) field on this DS18 data blank.

- P5: Using the DS10 data from P1, identify the up to nine types of forms units that apply to the form-as-a-whole for the form being entered in this execution of Function F3B.
- P6: Obtain the values (identifiers) for the types of forms units identified in P5 from the DS14 data from P1 and enter these values onto the DS18 data generated in P4.
- P7: Add the ID22 assigned to the DS18 data generated in P4 to the DL17 list for the ID18 and ID10 identified in P1.
- P8: Using DL30, determine whether there is only a default set (or a default series of sets) of DS17 data for the ID16 and ID10 identified in P1. Yes (i.e., there is only one set or one series of sets of allowable limits for this ID16 and it applies in all cases) = P10; No (i.e., there are one or more sets of allowable limits for this ID16 and ID10 and each is to be used (is applicable) in only limited cases; it is therefore necessary to determine which set or series of sets of allowable limits specifications data applies) = P9
- P9: GO TO P1 of Step F3B-9.
- P10: Using DL30, identify the requirement application identifier (ID5) or series of ID5s that are the default DS data sets for the ID16 from P1. Put the ID5s on a temporary list called the P10 list.
- FN1: FOR each ID5 on the P10 list:
- P11: Is this the first ID5 on the P10 list? Yes = P13; No = P12.
- P12: Begin generating a new set of DS18 data as described in P4 through P6. This DS18 data is referred to as the P12 DS18 data. Add the ID22 for this new DS14 data to the DL17 list for the ID18 and ID10 identified in P1.
- P13: Enter the ID5 from this iteration of FN1 on the DS18 data from either P4 (if the answer to P11 was 'Yes') or P12 (if the answer to P11 was 'No').
- P14: Locate the DS14 data for the ID5 for this iteration of FN1.

STEP 3B-8

P15: Using the DS17 data from P14, identify which of the up to nine forms units for the form in this execution of Function F3B (i.e., the forms units identified in P6 and entered on the DS18 data from P4 and P12) are to be used to evaluate allowable limits. Enter this information on the DS18 data from either P4 (if the answer to P11 was 'Yes') or P12 (if the answer to P11 was 'No').

P16: Using the DS17 data from P14, identify which of the up to nine forms units from P6 are to be used as requirement implementation units should a match be found with the allowable limits specified in this DS17 data. Enter this information on the DS18 data from either P4 (if the answer to P11 was 'Yes') or P12 (if the answer to P11 was 'No').

P17: NEXT FN1; end of FN1, GO TO P3.

OUTPUTS AND GENERATION OF DATA SETS:

DS18: Allowable limits check request data (for a form-as-a-whole)

### STEP F3B-9

Identify the factors that determine which allowable limits specifications are applicable to the particular type of form being entered in this execution Function F3B. Obtain the values for these factors from the current OHMIS data base, where available, and store these values. (If not possible to obtain all of these values from the current OHMIS data base, it may be necessary to conduct an allowable limits check (Function F3C) to determine which allowable limits are applicable.)

PREVIOUS STEP: Step F3B-9 follows P9 of Step F3B-8.

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

R1: Allowable limits check request data (DS18) generated in P4 of Step F3B-8

DS7: Data element typed information

DS15: Allowable limits applicability factors data

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

P1: Identify the forms specification identifier (ID16) and the OHMIS service area identifier (ID10) on the DS18 data from R1, i.e., the ID16 and ID10 for the form being entered in this execution of Function F3B.

P2: Locate the DS15 data for the ID16 and ID10 from P1.

P3: Abstract from the DS15 data located in P2 the up to five data element type codes (CT4) for the allowable limits applicability factors for each of the up to nine forms units for the form being entered in this execution of Function F3B. Enter these CT4 onto the DS18 data from R1.

FN1: FOR each of the CT4 identified in P3, i.e., each of the factors that determine which allowable limits specifications are applicable to the form being entered in this execution of Function F3B:

P4: Use the DS7 data to determine where/how the value for the data element type in this iteration of FN1 is stored. Determine whether there is a currently a value for this data element type (this allowable limits applicability factor) for the forms unit corresponding to this factor on the form being entered (as identified on the DS18 data from R1) on the OHMIS data base. Yes (i.e., the current

### STEP F3B-9

OHMIS data base contains the value for one of the data element types that will determine which allowable limits specifications are applicable) = P5; No = P6

P5: Enter the value for the allowable limits applicability factor (i.e., the value for the CT4 for this iteration of FN1 located in P4) on the DS18 data from R1.

P6: NEXT FN1; end of FN1, GO TO P7.

P7: Review the DS18 data from R1. Do all of the allowable limits applicability factors (i.e., the CT4s identified in P3) have values entered on the DS18 data? Yes (i.e., there is information available on the DS18 data from R1 to determine which allowable limits specifications data are applicable) = P9; No = P8

P8: Do some of the allowable limits applicability factors have values entered on the DS18 data from R1? Yes = P10; No (i.e., it is not possible to determine which allowable limits are applicable) = P11

P9: GO TO P1 of Step F3B-10.

P10: GO TO P19 of Step F3B-10.

P11: GO TO P1 of Step F3B-11.

OUTPUTS AND GENERATION OF DATA SETS: None

## STEP 3B-10

Determine whether there are any allowable limits specifications applicable to the form being entered for this execution of Function F3B, i.e., whether there are specified values for the allowable limits applicability factors for the type and version of form being entered that match the values for these factors for the forms unit(s) on the form being entered. If there are applicable allowable limits specifications, store the information on the identification of these specifications on the allowable limits check request data (DS18).

PREVIOUS STEP: Step F3B-10 follows P9 of Step F3B-9.

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

- R1: Allowable limits check request data (DS18) generated in P4 of Step F3B-8
- R2: List of data element type codes (CT4) that are the allowable limits applicability factors (i.e., the factors that determine which allowable limits specifications are applicable) for the form being entered in this execution of Function F3B. This list was obtained in P3 of Step F3B-9
- DS16: Allowable limits applicability values data
- DS17: Allowable limits specification data
- DL16: List of active (allowable limits specification) requirements application identifiers (ID5) by active allowable limits application identifier (ID20) and by OHMIS service area (ID10)
- DL17: List of allowable limits check request identifiers (ID22) by completed form identifier (ID18) and by OHMIS service area (ID10)
- DL22: List of active allowable limits application identifiers (ID20) by form specification identifier (ID16) and by OHMIS service area (ID10)

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

- P1: Identify the forms specification identifier (ID16) on the DS18 data from R1, i.e., the ID16 for the form being entered in this execution of Function F3B. Identify the completed form identifier (ID18) and the OHMIS service area identifier (ID10) on this set of DS18 data.



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P2: Using DL22, identify each of the allowable limits application identifiers (ID20) for the ID16 and for the ID10 from P1. Put on a list called the P2 list.

FN1: FOR each of the ID20s on the P2 list:

P3: Locate the DS16 data corresponding to the ID20.

P4: Compare the allowable limits applicability values specified in the DS16 data from P3 with the values for the corresponding data element types on the DS18 data from R1. Do they match (i.e., are the values in the DS16 data either blank (no specification for the data element type) or equal to (or have a range of values that contains a value that is equal to) the value for the corresponding data element type in the DS18 data)? Yes (i.e., the allowable limits specification data (DS17) or series of DS17 data with the ID20 for this iteration of FN1 is the applicable allowable limits specification data for the form being entered in this execution of Function F3B) = P5; No = P7

P5: Enter the ID20 for this iteration of FN1 onto the DS18 data from R1.

P6: GO TO P9.

P7: NEXT FN1; end of FN1, GO TO P8.

P8: Erase the set of DS18 data from R1; erase the allowable limits check request identifier (ID22) for this set of DS18 data from the DL17 list. GO TO P1 of Step F3B-11.

P9: Using the DL16 list, make a temporary list called the P9 list of all of the (allowable limits specification) requirement application identifiers (ID5) that match the ID20 on the DS18 data from R1 (i.e., the ID20 entered on the DS18 data in P5).

FN2: FOR each ID5 on the P9 list:

P10: Is this the first ID5 on the P9 list? Yes = P13; No = P11

P11: Begin generating a new set of DS18 data in the same way as described in P4 through P6 of Step F3B-8. Referred to as the P11 DS18 data.

P12: Add the ID22 for the new DS18 data generated in P11 to the DL17 list for the ID18 and ID10 identified in P1.

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P13: Enter the ID5 for this iteration of FN2 on the DS18 data from either R1 or R2 (if the answer to P10 was 'Yes') or P11 (if the answer to P10 was 'No').

P14: Locate the DS17 data for the ID5 for this iteration of FN2.

P15: Using the DS17 data from P14, identify which of the up to nine forms units for the form in this execution of Function F3B (i.e., the forms units identified in P6 of Step F3B-8 and entered onto the DS18 data from R1 or the DS18 data from P11) are to be used to evaluate allowable limits. Enter this information on the DS18 data from either R1 (if the answer to P10 was 'Yes') or P11 (if the answer to P10 was 'No').

P16: Using the DS17 data from P14, identify which of the up to nine forms units for the form in this execution of Function F3B are to be used as requirement implementation units should a match be found with the allowable limits specifications specified in this DS17 data. Enter this information on the DS18 data from either R1 (if the answer to P10 was 'Yes') or P11 (if the answer to P10 was 'No').

P17: NEXT FN2; end of FN2, GO TO P18.

P18: GO TO P1 of Step F3B-11.

P19: (Follows P10 out of Step F3B-9.) Identify the forms specification identifier (ID16) on the DS18 data from R1, i.e., the ID16 for the form being entered in this execution of Function F3B. Identify the OHMIS service area identifier (ID10) on this set of DS18 data.

P20: Using the DL22 list, identify each of the allowable limits application identifiers (ID20) for the ID16 and ID10 from P19. Put on a temporary list called the P20 list.

FN3: FOR each of the ID20s on the P20 list:

P21: Locate the DS16 data corresponding to the ID20.

FN3.1: FOR each of the data element type codes (CT4) from R2 (i.e., the allowable limits applicability factors for the form being entered in this execution of Function F3B):

P22: Does the DS16 data for P21 contain allowable limits applicability criteria (i.e., a specified value) for the data element type in this iteration of FN3.1? Yes (i.e., this data element type is one of the factors that determines the applicability of the allowable limits on this set of DS16 data; can be blank because not all sets

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of applicability values (DS16) have to use all of the applicability factors (DS15)) = P23; No = P27

- P23: Does the DS18 data from R1 contain a value for the data element type in this iteration of FN3.1? Yes (i.e., the current OHMIS data base did contain this value and the program was able to abstract it in P5 of Step F3B-9) = P26; No = P24
- P24: Generate a flag, called the P24 flag. Store a code (e.g., 'A') in the P24 flag. The code 'A' indicates that at this point in the FN3 loop (i.e., for this iteration of FN3.1) it is not possible to rule out the DS18 data from R1 (i.e., the form being entered in this execution of Function F3B) as definitely not matching the specified allowable limits applicability values given in the DS16 data corresponding to the ID20 for this iteration of FN3 (i.e., the DS16 data identified in P21). That is, unless there is a set of DS16 data (i.e., an ID20) that is found to definitely match at some later point in this FN3 loop, it will be necessary to obtain the DS18 data from R1 and have the user manually check for allowable limits (i.e., conduct an allowable limits check (Function F3C)) to determine if there are any applicable allowable limits specifications.
- P25: GO TO P27.
- P26: Does the value for the data element type in this iteration of FN3.1 in the DS16 data from P21 match the value for the same data element type in the DS18 data from R1? Yes = P27; No (i.e., the allowable limits applicability values in the set of DS16 data in this iteration of FN3 can be definitely determined not to match the values in the DS18 data from R1 and therefore the allowable limits specifications (DS17) that correspond to the ID20 and this iteration of FN3 are known not to be applicable to the form being entered in this execution of Function F3B) = P33
- P27: NEXT, FN3.1; end of FN3.1, GO TO P28.
- P28: Is there a code 'A' in the P24 flag? Yes = P31; No (i.e., the allowable limits specification data (DS17) or series of DS17 data with the ID20 for this iteration of FN3 is the applicable allowable limits specification data for the form being entered in this execution of Function F3B) = P29
- P29: Enter the ID20 for this iteration of FN3 onto the DS18 data from R1.

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P30: GO TO P9.

P31: Erase the flag in P24.

P32: Generate a flag called the P32 flag. Fill this flag with the code 'B' indicating that there is at least one set of DS16 data for which it was not possible to determine whether this DS16 data identifies the applicable allowable limits for the form being entered in this execution of Function F3B. That is, unless a match to the allowable limits applicability values given in other sets of DS16 data is found (i.e., in other iterations of FN3), it will not be possible to identify which set of allowable limits specifications are applicable and an allowable limits check (Function F3C) will need to be conducted.

P33: NEXT FN3; end of FN3, GO TO P34.

P34: Is there a code 'B' in the P32 flag? Yes (i.e., it is not possible to determine which are the applicable allowable limits for the form being entered) = P18; No (i.e., it was possible to determine that none of the allowable limits specifications are applicable to the form being entered in this execution of Function F3B) = P8

OUTPUTS AND GENERATION OF DATA SETS:

DS18: Allowable limits check request data (for a form-as-a-whole)

### STEP F3B-11

This Step begins the process of evaluating allowable limits for each of the data elements for the form being entered in this execution of Function F3B. In this Step, the program determines for each of these data element types whether there are any allowable limits specifications and, if so, whether there are default allowable limits specifications for the data element type.

Step F3B-11 is equivalent to Step F3B-8 for the form-as-a-whole allowable limits evaluation.

PREVIOUS STEP: Step F3B-11 follows P3 of Step F3B-8; or of Step F3B-9; or, P8 or P18 of Step F3B-10.

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

- R1: Completed form identifier (ID18) retained in P1 of Step F3B-1, i.e., the ID18 of the form being entered in this execution of Function F3B
- R2: Next available allowable limits checks request identifier (ID22)
- R3: Current date
- DS10: Forms description data
- DS14: Completed forms data
- DS17: Allowable limits specification data
- DL15: List of active allowable limits application identifiers (ID20) by forms subpart identifier (ID17) and by OHMIS service area (ID10)
- DL17: List of allowable limits check request identifiers (ID22) by completed form identifier (ID18) and by OHMIS service area (ID10)
- DL20: List of the active default (allowable limits specification) requirement application identifiers (ID5) by the forms subpart identifier (ID17) and by the OHMIS service area (ID10)

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

- P1: Locate the DS14 data for the ID18 from R1. Locate the DS10 data corresponding to the forms specification

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identifier (ID16) for this DS14 data. Also, locate the OHMIS service area identifier (ID10) and previous ID18, if any, that are on this DS14 data.

P2: Using the DS10 data identified in P1, form a temporary list of the forms subpart identifiers (ID17) contained in the form being entered in this execution of Function F3B, i.e., the contents of this form. This is called the P2 list.

FN1: FOR each ID17 on the P2 list:

P3: Using the DL15 list, determine whether there are any allowable limits specifications data (DS17) for the ID17 for this iteration of FN1 and the ID10 identified in P1, i.e., whether there are any allowable limits specified for entering any of the data elements in the forms subpart in this iteration of FN1. Yes = P4; No = P24

P4: Add the ID17 for this iteration of FN1 to a list of ID17s called the P4 list. Retain this list throughout Function F3B.

P5: Begin generating a set of DS18 data for the forms subpart in this iteration of FN1. Assign the ID22 from R2; the ID10 from P1; the date from R3; the ID18 from R1 as the first ID18, i.e., the ID18 identifying the DS14 data from P1 for the form being entered in this execution of Function F3B; and, the ID18 from the previous set of DS14 data, if any, from P1. Identify this set of DS18 data as for a forms subpart (i.e., assign the answer '1'). Assign the forms specification identifier (ID16) from P1. Assign the ID17 from this iteration of FN1.

P6: Using the DS10 data from P1, identify the up to 6 types of forms units that apply to the forms subpart (ID17) in this iteration of FN1.

P7: Obtain the values (identifiers) for the types of forms unit(s) identified in P6 for the DS14 data from P1 and enter these values onto the DS18 data generated in P5.

P8: Locate the DS11 data corresponding to the ID17 in this iteration of FN1.

P9: Identify each of the up to 6 data element types that make up the forms subpart (ID17) for this iteration of FN1. Put on a temporary list called the P9 list.

P10: Using the DS10 data from P1 and the DS11 data from P8, locate the value for each of the 6 data element types

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identified on the P9 list on the DS14 data from P1. Enter these values on the DS18 data generated in P5.

P11: Add the ID22 assigned to the DS18 data generated in P5 to the DL17 list for the ID18 and the ID10 identified in P1.

P12: Using the DL20 list, determine whether there is only a default set (or a default series of sets) of allowable limits specifications data (DS17) for the ID17 in this iteration of FN1 and the ID10 from P1. Yes (i.e., there is only one set or one series of sets of allowable limits for this ID17 and it applies in all cases) = P15; No (i.e., there are one or more sets of allowable limits for this ID17 and each is to be used (is applicable) in only limited cases; therefore, it is necessary to determine which set or series of sets of allowable limits data applies to the ID17 in this iteration of FN1) = P13

P13: Put the ID17 for this iteration of FN1 on a list, called the P13 list. This is the list of forms subparts for which it will be necessary to determine if there are applicable allowable limits.

P14: GO TO P24.

P15: Using the DL20 list, identify the requirement application identifier (ID5) or series of ID5s that are default DS17 sets for the ID17 in this iteration of FN1. Put the ID5s on a list called the P15 list. Retain this list throughout Function F3B.

FN1.1: FOR each ID5 on the P15 list:

P16: Is this the first ID5 on the P15 list? Yes = P19; No = P17

P17: Begin generating a new set of DS18 data as described in P5 through P10. Refer to this as the P17 DS18 data.

P18: Add the ID22 for the new DS18 data generated in P17 to the DL17 list for the ID18 and ID10 identified in P1.

P19: Enter the ID5 for this iteration of FN1.1 on the DS18 data from either P5 (if the answer to P16 was 'Yes') or P17 (if the answer to P16 was 'No').

P20: Locate the DS17 data for the ID5 from this iteration of FN1.1.

P21: Using the DS17 data from P20, identify which of the up to 6 forms units for the ID17 in this iteration of FN1 (that were entered on the DS18 data from P5 or P17) are to be

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used to evaluate allowable limits. Enter this information on the DS18 data generated in either P5 (if the answer to P16 was 'Yes') or P17 (if the answer to P16 was 'No').

P22: Using the DS17 data from P20, identify which of the up to 6 forms units for the ID17 in this iteration of FN1 are to be used as requirement implementation units should a match be found to the allowable limits specified in this DS17 data. Enter this information on the DS18 data from either P5 (if the answer to P16 was 'Yes') or P17 (if the answer to P16 was 'No').

P23: NEXT FN1.1; end of FN1.1, GO TO P24.

P24: NEXT FN1; end of FN1, GO TO P25.

P25: GO TO P1 of Step F3B-12.

OUTPUTS AND GENERATION OF DATA SETS:

DS18: Allowable limits check request data (for a forms subpart)



## STEP F3B-12

For each of the sets of data element types (contained in forms subparts) on the form being entered in this execution of Function F3B for which there are potentially applicable allowable limits specifications and these were not determined in Step F3B-11 to be the default allowable limits specifications (i.e., for which it is necessary to determine which allowable limits specifications are applicable) identify the factors that determine which allowable limits specifications are applicable. Obtain the values for these factors from the current OHMIS data base, if available, and store them. Identify those data element types for which it was not possible to obtain some or all of these values.

Step F3B-12 is equivalent to Step F3B-9 for the form-as-a-whole allowable limits evaluation.

PREVIOUS STEP: Step F3B-12 follows P25 of Step F3B-11.

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

- R1: The list of forms subpart identifiers (ID17) retained in P13 of Step F3B-11, i.e., the list of ID17s for which there are potentially applicable allowable limits specifications, but for which it has not yet been determined whether the allowable limits specifications are in fact applicable
- R2: The completed form identifier (ID18) retained in P1 of Step F3B-1, i.e., the ID18 for the form being entered in this execution of Function F3B
- DS7: Data element type information
- DS14: Completed forms data
- DS15: Allowable limits applicability factors data
- DS18: Allowable limits check request data
- DL17: List of allowable limits check request identifiers (ID22) by completed form identifier (ID18) and by OHMIS service area (ID10)

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

- P1: Does the list from R1 (i.e., the list of ID17s for which it is necessary to determine if there are applicable allowable limits specifications) contain any value?

STEP F3B-12

Yes = P3; No (i.e., there are no ID17s for which the applicable allowable limits specifications have not been identified) = P2

P2: GO TO P1 of Step F3B-16.

P3: Locate the DS14 data corresponding to the ID18 from R2 (i.e., the data for the form being entered in this execution of Function F3B). Locate the OHMIS service identifier (ID10) on this DS10 data.

P4: Using the DL17 list, locate all allowable limits check request identifiers (ID22) for the ID18 from R2 and the ID10 from P3. Put on a temporary list called the P4 list.

FN1: FOR each ID22 on the P4 list:

P5: Locate the DS18 data corresponding to this ID22.

P6: Locate the forms subpart identifier (ID17) on the DS18 data from P5, i.e., the ID17 for which applicable allowable limits are being identified in this iteration of FN1.

P7: Is the ID17 from P6 on the R1 list? Yes (i.e., this is DS18 data for which applicable allowable limits specifications need to be identified) = P8; No = P18

P8: Locate the DS15 data for the ID17 from P6 and the ID10 from P3.

P9: Abstract from the DS15 data located in P8 the up to 5 data element type codes (CT4) for the allowable limits applicability factors for each of the up to 6 forms units for the forms subpart identified in P6. Enter these CT4s onto the DS18 data from P5.

FN1.1: FOR each of the CT4s identified in P9, i.e., each of the factors that determine allowable limits specifications are applicable to the forms subpart identified in P6:

P10: Use the DS7 data to determine where/how to locate the value for the data element type in this iteration of FN1.1. Determine whether the current OHMIS data base contains a value for this data element type (this allowable limits applicability factor) for the forms unit(s) shown on the form being entered in this execution of Function F3B that correspond to the forms subpart (ID17) (as identified on the DS18 data from P5). Yes (i.e., the current OHMIS data base does contain the value for one of the data element types that will determine which allowable limits specifications are applicable) = P11; No = P12

STEP F3B-12

P11: Enter the value for the allowable limits applicability factor (i.e., the value for the CT4 for this iteration of FN1.1) on the DS18 data from P5.

P12: NEXT FN1.1; end of FN1.1, GO TO P13.

P13: Review the DS18 data from P5. Do all of the allowable limits applicability factors (i.e., the CT4s identified in P9) have values entered on the DS18 data from P5? Yes (i.e., there is information on the DS18 data from P5 to determine which allowable limits specifications are applicable to the forms subpart data (ID17) from P6, i.e., the forms subpart for this iteration of FN1) = P15; No = P14

P14: Do some of the allowable limits applicability factors have values entered on the DS18 data from P5? Yes = P17; No (i.e., it is not possible to determine which allowable limits are applicable and therefore an allowable limits check (Function F3C) will need to be conducted) = P18

P15: Place the ID22 from this iteration of FN1 on a temporary list called the P15 list. Retain throughout Function F3B.

P16: GO TO P18.

P17: Place the ID22 for this iteration of FN1 on a temporary list, called the P17 list. Retain throughout Function F3B.

P18: NEXT FN1; end of FN1, GO TO P19.

P19: GO TO P1 of Step F3B-13.

OUTPUTS AND GENERATION OF DATA SETS: None

### STEP F3B-13

Determine whether there are any allowable limits specifications applicable to the forms subparts that make up the form that is being entered in this execution of Function F3B, i.e., whether these specified values for the allowable limits applicability factors for each type of forms subpart match the values for the particular forms subpart entered on this form or the values for the characteristics of the forms units corresponding to each forms subpart. If there are applicable allowable limits specifications, store the information on the identification of these specifications on an allowable limits check request data set (DS18).

Step F3B-13 is equivalent to Step F3B-10 for the form-as-a-whole allowable limits evaluation.

PREVIOUS STEP: Step F3B-13 follows P19 of Step F3B-12 or follows P20 of F3B-15, if this execution of Function F3B is for a Missing Data Element Type Form.

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

- R1: The list of allowable limits check request identifiers (ID22) that contain all of the information needed to determine whether there are any applicable allowable limits. Retained in P15 of Step F3B-12 or from P16 of Step F3B-15 if this execution of Function F3B is for a Missing Data Element Type Form
- R2: The list of allowable limits check request identifiers (ID22) that contain some of the information needed to determine whether there are any applicable allowable limits. Retained in P17 of Step F3B-12 or in P18 of Step F3B-15 (for Missing Data Element Type Forms)
- DS17: Allowable limits specification data
- DS18: Allowable limits check request data
- DL15: List of active allowable limits application identifiers (ID20) by forms subpart identifier (ID17) and by OHMIS service area (ID10)
- DL16: List of active (allowable limits specification) requirement application identifiers (ID5) by active allowable limits application identifier (ID20) and by OHMIS service area (ID10)

STEP F3B-13

DL17: List of allowable limits check request identifiers (ID22) by completed form identifier (ID18) and by OHMIS service area (ID10)

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

FN1: FOR each allowable limits check request identifier (ID22) on the R1 list:

P1: Locate the DS18 data corresponding to this ID22.

P2: Identify the forms subpart identifier (ID17) covered on the DS18 data from P1. Also identify the completed form identifier (ID18) and the OHMIS service area identifier (ID10) on the DS18 data.

P3: Using the DL15 list, identify each of the allowable limits application identifiers (ID20) for the ID17 and ID10 from P2. Put on a list called the P3 list.

FN1.1: FOR each of the ID20s on the P3 list:

P4: Locate the DS16 data corresponding to the ID20.

P5: Compare the allowable limits applicability values specified in the DS16 data from P4 with the values for the corresponding data element types on the DS18 data from P1. Do they match? That is, are the values in the DS16 data either blank (no specification for the data element type) or equal to (or provide a range that contains a value equal to) the value for the corresponding data element type in the DS18 data? Yes (i.e., the allowable limits specification data (DS17) or series of DS17 data with the ID20 for this iteration of FN1.1 is the applicable allowable limits specification data for the forms subpart in this iteration of FN1 (i.e., covered by the DS18 data in this iteration of FN1)) = P6; No = P8

P6: Enter the ID20 for this iteration of FN1.1 onto the DS18 data from P1.

P7: GO TO P11.

P8: NEXT FN1.1; end of FN1.1, GO TO P9.

P9: Erase the set that singular of DS18 data from P1; erase the ID22 for this set of DS18 data from the DL17 list.

P10: GO TO P21.

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P11: Using the DL16 list, make a temporary list, called the P11 list, of all of the (allowable limits specifications) requirement application identifiers (ID5) that match the ID20 on the DS18 data from P1.

FN1.2: FOR each ID5 on the P11 list:

P12: Is this the first ID5 on the P11 list? Yes = P15; No = P13

P13: Begin generating a new set of DS18 data in the same way as described in P5 through P10 of Step F3B-11 (or P10 through P14 of Step F3B-15, if this execution of Function F3B is for a Missing Data Element Type Form). Refer to as the P13 DS18 data.

P14: Add the ID22 for the new DS18 data generated in P13 to the DL17 list for the ID18 and ID10 identified in P2.

P15: Enter the ID5 for this iteration of FN1.2 on the DS18 data from either P1 (if the answer to P12 was 'Yes') or P13 (if the answer to P12 was 'No').

P16: Locate the DS17 data for the ID5 from this iteration of FN1.2.

P17: Using the DS17 data from P16, identify which of the up to six forms units for the forms subpart (DS11; ID17) covered by the DS18 data in this iteration of FN1 are to be used to evaluate allowable limits.

P18: Enter the information obtained in P17 onto the DS18 data from either P1 (if the answer to P12 was 'Yes') or P13 (if the answer to P12 was 'No').

P19: Using the DS17 data from P16, identify which of the up to six forms units for the forms subpart covered by this iteration of FN1 are to be used as requirement implementation units should a match be found to the allowable limits specified in this DS17 data. Enter this information onto the DS18 data from either P1 (if the answer to P12 was 'Yes') or P13 (if the answer to P12 was 'No').

P20: NEXT FN1.2; end of FN1.2, GO TO P21.

P21: NEXT FN1; end of FN1, GO TO FN2 (P22).

FN2: FOR each of the allowable limits check request identifiers (ID22) on the R2 list:

P22: Locate the DS18 data corresponding to this ID22.

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- P23: Identify the forms subpart identifier (ID17) on the DS18 data from P22. Also identify the completed form identifier (ID18) and the OHMIS service area identifier (ID10) on the DS18 data.
- P24: Using the DL15 list, identify each of the allowable limits application identifiers (ID20) for the ID17 and ID10 from P23. Put on a temporary list called the P24 list.

FN2.1: FOR each of the ID20s on the P24 list:

- P25: Locate the DS16 data corresponding to the ID20.
- P26: Using the DS18 data from P22, identify each of the data element types (CT4) that are the applicability factors (i.e., the factors that determine which allowable limit is applicable) for the forms subpart (DS11; ID17) covered by the DS18 data from this iteration of FN2. Put on a list called the P26 list.

FN2.1.1: FOR each of the CT4s on the P26 list:

- P27: Does the DS16 data from P25 contain allowable limits applicability criteria (i.e., a specified value) for this data element type? Yes (i.e., this data element type is one of the factors that determines the applicability of allowable limits on this set of DS16 data) = P28; No = P31
- P28: Does the DS18 from P22 contain a value for the data element type in this iteration of FN2.1.1? Yes (i.e., the current OHMIS data base did contain this value and the program was able to abstract it in P10 of Step F3B-12) = P26; No = P29
- P29: Generate a flag, called the P29 flag. Store a code (e.g., 'A') in the P29 flag. The code 'A' indicates that at this point in the FN2.1 loop (i.e., for this iteration of FN2.1.1) it is not possible to rule out the DS18 data from P22 (i.e., the forms subpart for this iteration of FN2) as definitely not matching the specified allowable limits applicability values given in the DS16 data corresponding to the ID20 for this iteration of FN2.1 (i.e., the DS16 data identified in P25). That is, unless there is a set of DS16 data (ID20) that is found to definitely match at some later point in this FN2.1, it will be necessary to retain the DS18 data from P22 and the user will have to conduct an allowable limits check (i.e., Function F3C) to determine if there are any applicable allowable limits specifications.
- P30: GO TO P32.

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P31: Does the value for the data element type in this iteration of FN2.1.1 in the DS16 data from P25 match the value for the same data element type in the DS18 data from P22? Yes = P32; No (i.e., the allowable limits applicability values in the set of DS16 data and this iteration of FN2.1 can be definitely determined to not match the same values in the DS18 data from P22 and therefore the allowable limits specifications (DS17 data) corresponding to the DS16 data in this iteration of FN2.1 can be determined to definitely not be applicable) = P47

P32: NEXT FN2.1.1; end of FN2.1.1, GO TO P33.

P33: Is there a code 'A' in the P29 flag? Yes = P45; No (i.e., the allowable limits specification data (DS17) or series of DS17 data with the ID20 for this iteration of FN2.1 is the applicable allowable limits specification data for the forms subpart covered in this iteration of FN2) = P34

P34: Enter the ID20 for this iteration of FN2.1 onto the DS18 data from P22.

P35: Using the DL16 list, make a temporary list, called the P35 list, of all of the (allowable limits specification) requirement application identifiers (ID5) that match the ID20 on the DS18 data from P22 (i.e., the ID20 entered on the DS18 data in P34).

FN2.1.2: FOR each ID5 on the P35 list:

P36: Is this the first ID5 on the P35 list? Yes = P39; No = P37

P37: Begin generating a new set of DS18 data in the same way as described in P5 through P9 of Step F3B-11 (or P10 through P14 of Step F3B-15 if this execution of Function F3B is for a Missing Data Element Type Form). Refer to as the P37 DS18 data.

P38: Add the ID22 for the new DS18 data generated in P37 to the DL17 list for the ID18 and ID10 identified in P23.

P39: Enter the ID5 for this iteration of FN2.1.2 on the DS18 data from either P22 (if the answer to P36 was 'Yes') or P37 (if the answer to P36 was 'No').

P40: Locate the DS17 data for the ID5 from this iteration of FN2.1.2.

P41: Using the DS17 data for P40 identify which of the up to six forms units for the forms subpart (DS11; ID17) covered by the DS18 data in this iteration of FN2 are to be used



STEP F3B-13

to evaluate allowable limits. Enter this information on the DS18 data from either P22 (if the answer to P36 was 'Yes') or P37 (if the answer to P36 was 'No').

P42: Using the DS17 data from P40, identify which of the up to six forms units for the forms subpart covered by this iteration of FN2 are to be used as requirement implementation units should a match be found to the allowable limits specified in this DS17 data. Enter this information on the DS18 data from either P22 (if the answer to P36 was 'Yes') or P37 (if the answer to P36 was 'No').

P43: NEXT FN2.1.2; end of FN2.1.2, GO TO P44.

P44: GO TO P50.

P45: Erase the flag in P29.

P46: Generate a flag called the P46 flag. Fill this flag with a code (e.g., code 'B') indicating that there is at least one set of DS16 data for which it was not possible to determine whether this DS16 data identifies the applicable allowable limits for the forms subpart in this iteration of FN2. That is, unless a match to another set of DS16 data is found, it will be necessary to conduct an allowable limits check (Function F3C) to determine which allowable limits are applicable.

P47: NEXT FN2.1; end of FN2.1, GO TO P48.

P48: Is there a code 'B' in the P46 flag? Yes (i.e., it is not possible to determine which are the applicable allowable limits for the forms subpart (DS11; ID17) covered in the DS18 data in this iteration of FN2) = P50; No (i.e., it was possible to determine that none of the allowable limits specifications are applicable to the forms subpart in this iteration of FN2) = P49

P49: Erase the set of DS18 data from P22; erase the allowable limits check request identifier (ID22) for this set of DS18 data from the DL17 list.

P50: NEXT FN2; end of FN2, GO TO P51.

P51: GO TO P1 of Step F3B-16.

OUTPUTS AND GENERATION OF DATA SETS:

DS18: Allowable limits check request data (for a forms subpart)

## STEP F3B-14

This Step begins the process of evaluating allowable limits for each of the missing data elements for the Missing Data Element Type Form being entered in this execution of Function F3B. In this Step, the program determines for each of these data element types whether there are any allowable limits specifications and, if so, whether there are default allowable limits specifications for the data element type.

Step F3B-14 is equivalent to Step F3B-11 for the allowable limits evaluation of data elements on a regular form (i.e., not a Missing Data Element Type Form).

PREVIOUS STEP: Step F3B-14 follows P94 of Step F3B-7.

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

- R1: Completed form identifier (ID18) retained in P1 of Step F3B-1, i.e., the ID18 of the form being entered in this execution of Function F3B
- R2: Next available allowable limits checks request identifier (ID22)
- R3: Current date
- DS10: Forms description data
- DS14: Completed forms data
- DS17: Allowable limits specification data
- DS19: Missing data element information
- DS22: Outstanding (uncompleted) forms monitoring data
- DL15: List of active allowable limits application identifiers (ID20) by forms subpart identifier (ID17) and by OHMIS service area (ID10)
- DL17: List of allowable limits check request identifiers (ID22) by completed form identifier (ID18) and by OHMIS service area (ID10)
- DL20: List of the active default (allowable limits specification) requirement application identifiers (ID5) by the forms subpart identifier (ID17) and by the OHMIS service area (ID10)

STEP F3B-14

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

- P1: Locate the DS22 data corresponding to the ID18 from R1.
- FN1: FOR each of the missing data element type information identifiers (ID21) on the DS22 data from P1:
  - P2: Locate the DS19 data corresponding to the ID21. Use this data to identify the data element type that was missing and was entered onto the OHMIS data base using the Missing Data Element Type Form in this execution of Function F3B.
  - P3: Using the DS19 data from P2, determine if the missing data element type for this iteration of FN1 is stored on an OHMIS form. Yes = P5; No = P4
  - P4: GO TO P28.
  - P5: Use the DS19 data to identify the completed form identifier (ID18) for the completed forms data (DS14) from which the missing data element type in this iteration of FN1 was missing.
  - P6: Locate the DS14 data corresponding to the ID18 from P5. Also, identify the DS10 data corresponding to the forms specification identifier (ID16) on this DS14 data. Also, identify the OHMIS service area identifier (ID10) on this DS14 data and identify the previous completed form identifier (ID18), if any, on this DS14 data.
  - P7: Using the DS19 data from P2, identify the forms subpart identifier (ID17) that indicates from which forms subpart (DS11) on the form the missing data element type for this iteration of FN1 was missing.
  - P8: Using the DL15 list, determine whether there are any allowable limits specifications data (DS17) for the ID17 identified in P7 and the ID10 identified in P6, i.e., whether there are any allowable limits specified for entering any of the data elements in the forms subpart. Yes = P9; No = P28
  - P9: Add the ID17 from P7 to a list of ID17s called the P9 list. Retain this list throughout Function F3B.
  - P10: Begin generating a set of DS18 data for the forms subpart from P7. Assign the ID22 from R2; the ID10 from P6; the date from R3; the ID18 from P5 as the first ID18, i.e., the ID18 identifying the DS14 data from P6 for the form onto which the missing data element being entered in this iteration of FN1; and, the ID18 from the previous set of DS14 data, if any, from P6. Identify this set of DS18

STEP F3B-14

data as for a forms subpart (i.e., assign the answer '1').  
Assign the forms specification identifier (ID16) from P6.  
Assign the ID17 from P7.

P11: Using the DS10 data from P6, identify the up to 6 types of forms units that apply to the forms subpart (ID17) from P7.

P12: Obtain the values (identifiers) for the types of forms unit(s) identified in P11 for the DS14 data from P6 and enter these values onto the DS18 data generated in P10.

P13: Locate the DS11 data corresponding to the ID17 from P7.

P14: Using the DS10 data from P6 and the DS11 data from P13, locate the value for the data element type in this iteration of FN1 on the DS14 data located in P6. Enter this value on the DS18 data generated in P10.

P15: Add the ID22 assigned to the DS18 data generated in P10 to the DL17 list for the ID18 identified in P5 and the ID10 identified in P6.

P16: Using the DL20 list, determine whether there is only a default set (or a default series of sets) of allowable limits specifications data (DS17) for the ID17 from P7. and the ID10 from P6. Yes (i.e., there is only one set or one series of sets of allowable limits for this ID17 and it applies in all cases) = P19; No (i.e., there are one or more sets of allowable limits for this ID17 and each is to be used (is applicable) in only limited cases; therefore, it is necessary to determine which set or series of sets of allowable limits data applies to the ID17 from P7) = P17

P17: Put the ID21 for this iteration of FN1 on a list called the P17 list. This is the list of missing data element types for which it will be necessary to determine if there are applicable allowable limits.

P18: GO TO P28.

P19: Using the DL20 list, identify the requirement application identifier (ID5) or series of ID5s that are default DS17 sets for the ID17 from P7. Put the ID5s on a list called the P19 list. Retain this list throughout Function F3B.

FN1.1: FOR each ID5 on the P19 list:

P20: Is this the first ID5 on the P19 list? Yes = P23; No = P21

STEP F3B-14

- P21: Begin generating a new set of DS18 data as described in P10 through P14. Refer to this as the P21 DS18 data.
- P22: Add the ID22 for the new DS18 data generated in P21 to the DL17 list for the ID18 identified in P5 and ID10 identified in P6.
- P23: Enter the ID5 for this iteration of FN1.1 on the DS18 data from either P10 (if the answer to P20 was 'Yes') or P21 (if the answer to P20 was 'No').
- P24: Locate the DS17 data for the ID5 from this iteration of FN1.1.
- P25: Using the DS17 data from P24, identify which of the up to 6 forms units for the ID17 from P7 (that were entered on the DS18 data from P10 or P21) are to be used to evaluate allowable limits. Enter this information on the DS18 data generated in either P10 (if the answer to P20 was 'Yes') or P21 (if the answer to P20 was 'No').
- P26: Using the DS17 data from P24, identify which of the up to six forms units for the ID17 from P7 are to be used as requirement implementation units should a match be found to the allowable limits specified in this DS17 data. Enter this information on the DS18 data from either P10 (if the answer to P20 was 'Yes') or P21 (if the answer to P20 was 'No').
- P27: NEXT FN1.1; end of FN1.1, GO TO P28.
- P28: NEXT FN1; end of FN1, GO TO P29.
- P29: GO TO P1 of Step F3B-15.

OUTPUTS AND GENERATION OF DATA SETS:

DS18: Allowable limits check request data (for a forms subpart)

### STEP F3B-15

For each of the data element types on the Missing Data Element Type Form being entered in this execution of Function F3B for which there are potentially applicable allowable limits specifications and these were not determined in Step F3B-14 to be the default allowable limits specifications (i.e., for which it is necessary to determine which allowable limits specifications are applicable) identify the factors that determine which allowable limits specifications are applicable. Obtain the values for these factors from the current OHMIS data base, if available, and store them. Identify those data element types for which it was not possible to obtain some or all of these values.

Step F3B-15 is equivalent to Step F3B-12 for the allowable limits evaluation of data elements on a regular form (i.e., not a Missing Data Element Type Form).

PREVIOUS STEP: Step F3B-15 follows P29 of Step F3B-14.

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

- R1: The list of missing data element type identifiers (ID21) retained in P17 of Step F3B-14, i.e., the list of ID21s for which there are potentially applicable allowable limits specifications, but for which it has not yet been determined whether the allowable limits specifications are in fact applicable
- R2: The completed form identifier (ID18) retained in P1 of Step F3B-1, i.e., the ID18 for the Missing Data Element Type Form being entered in this execution of Function F3B
- DS7: Data element type information
- DS14: Completed forms data
- DS15: Allowable limits applicability factors data
- DS18: Allowable limits check request data
- DS19: Missing data element information
- DS22: Outstanding (uncompleted) forms monitoring data
- DL17: List of allowable limits check request identifiers (ID22) by completed form identifier (ID18) and by OHMIS service area (ID10)

STEP F3B-15

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

- P1: Does the list from R1 (i.e., the list of missing data element types (ID21s) for which it is necessary to determine if there are applicable allowable limits specifications) contain any value?
- Yes = P3; No (i.e., there are no ID21s for which the applicable allowable limits specifications have not been identified) = P2
- P2: GO TO P1 of Step F3B-16.
- FN1: FOR each of the missing data element type information identifiers (ID21) on the R1 list:
- P3: Locate the DS19 data corresponding to the ID21.
- P4: Use the DS19 data from P3 to identify the completed form identifier (ID18) for the completed forms data (DS14) from which the missing data element type in this iteration of FN1 was missing.
- P5: Locate the DS14 data corresponding to the ID18 from P4. Identify the OHMIS service area (ID10) on this DS14 data.
- P6: Using the DL17 list, locate the allowable limits check request identifier (ID22) for the ID18 and the ID10 from P5. Put on a temporary list called the P6 list.
- P7: Locate the DS18 data corresponding to the ID22 from P6.
- P8: Locate the forms subpart identifier (ID17) on the DS18 data from P7, i.e., the ID17 for which applicable allowable limits are being identified in this iteration of FN1.
- P9: Locate the DS15 data for the ID17 from P8 and the ID10 from P5.
- P10: Abstract from the DS15 data located in P9 the up to 5 data element type codes (CT4) for the allowable limits applicability factors for each of the up to 6 forms units for the forms subpart identified in P6. Enter these CT4s onto the DS18 data from P7.
- FN1.1: FOR each of the CT4s identified in P10, i.e., each of the factors that determine allowable limits specifications are applicable to the forms subpart identified in P8:
- P11: Use the DS7 data to determine where/how to locate the value for the data element type in this iteration of

STEP F3B-15

FN1.1. Determine whether the current OHMIS data base contains a value for this data element type (this allowable limits applicability factor) for the forms unit(s) shown on the form onto which the missing data element in this iteration of FN1 is being entered that corresponds to the forms subpart (ID17) from P8 (as identified on the DS18 data from P7). Yes (i.e., the current OHMIS data base does contain the value for one of the data element types that will determine which allowable limits specifications are applicable) = P12; No = P13

P12: Enter the value for the allowable limits applicability factor (i.e., the value for the CT4 for this iteration of FN1.1) on the DS18 data from P7.

P13: NEXT FN1.1; end of FN1.1, GO TO P14.

P14: Review the DS18 data from P7. Do all of the allowable limits applicability factors (i.e., the CT4s identified in P10) have values entered on the DS18 data from P7? Yes (i.e., there is information on the DS18 data from P5 to determine which allowable limits specifications are applicable to the forms subpart data (ID17) from P8, i.e., the forms subpart for this iteration of FN1) = P16; No = P15

P15: Do some of the allowable limits applicability factors have values entered on the DS18 data from P7? Yes = P18; No (i.e., it is not possible to determine which allowable limits are applicable and therefore an allowable limits check (Function F3C) will need to be conducted) = P19

P16: Place the ID22 from P6 on a temporary list called the P16 list. Retain throughout Function F3B.

P17: GO TO P19.

P18: Place the ID22 from P6 on a temporary list, called the P18 list. Retain throughout Function F3B.

P19: NEXT FN1; end of FN1, GO TO P20.

P20: GO TO P1 of Step F3B-13.

OUTPUTS AND GENERATION OF DATA SETS: None



### STEP F3B-16

Identify the complete list of potential allowable limits specifications that need to be evaluated; there can be none or one or more sets of allowable limits specifications data (DS17) for the form-as-a-whole and for each form subpart entered as a part of the entry of the form for this execution of Function F3B. If there are no such allowable limits specifications, end Function F3B. For each such allowable limits specification, determine whether the allowable limits evaluation can be done automatically, i.e., in Function F3B, or whether the user must conduct a manual allowable limits check in Function F3C.

PREVIOUS STEP: Step F3B-16 follows P2 of Step F3B-12; P51 of Step F3B-13; or P2 of Step F3B-15.

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

- R1: Completed form identifier (ID18) for the form being entered in this execution of Function F3B. Retained in P1 of Step F3B-1.
- R2: OHMIS user type (CT1). From P2 of Step F1A-2.
- DS17: Allowable limits specification data
- DS19: Missing data element information
- DS22: Outstanding (uncompleted) forms monitoring data
- DL17: List of allowable limits check request identifiers (ID22) by completed form identifier (ID18) and by OHMIS service area (ID10)

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

- P1: Locate the DS22 data for the ID18 from R1.
- P2: Is the DS22 data located in P1 for a Missing Data Element Type Form? Yes = FN1 (P5); No = P3
- P3: Add the ID18 from R1 to a temporary list called the P3 list. Retain this list throughout Function F3B.
- P4: GO TO FN2 (P11).
- FN1: FOR each of the missing data element type information identifiers (ID21) on the DS22 data from P1:

STEP F3B-16

- P5: Locate the DS19 data for this ID21.
- P6: Using the DS19 data from P5, determine if the missing data element is stored on an OHMIS form. Yes = P8; No = P7
- P7: GO TO P10.
- P8: Using the DS19 data from P5, identify the completed form identifier (ID18) for the completed forms data (DS14) from which the missing data element type in this iteration of FN1 was missing.
- P9: Put the ID18 from P8 onto the P3 list. (Do not enter this ID18 on the list if it has already been put on the list.)
- P10: NEXT FN1; end of FN1, GO TO FN2 (P11).
- FN2: FOR each of the ID18s on the P3 list:
- P11: Locate the DS14 data corresponding to the ID18 for this iteration of FN2. Identify the OHMIS service area identifier (ID10) on this DS14 data.
- P12: Using the DL17 list, identify all of the allowable limits check request identifiers (ID22) for the ID18 from this iteration of FN2 and the ID10 from P11. Put on a temporary list called the P12 list and retain throughout Function F3B.
- P13: NEXT FN2; end of FN2, GO TO P14.
- P14: Are there any ID22s on the P12 list? Yes = FN3 (P15); No (i.e., there are no allowable limits to evaluate for this execution of Function F3B) = P23
- FN3: FOR each of the ID22s on the P12 list:
- P15: Locate the DS18 data for the ID22.
- P16: Determine if the (allowable limits specification) requirement application identifier (ID5) field on the DS18 data from P15 is filled, i.e., whether the applicable allowable limits specifications have been identified. Yes = P17; No (i.e., a manual allowable limits check (Function F3C) in which the user supplies the values for the applicability factors needed to determine which allowable limits specifications are applicable is needed for the form-as-a-whole or for the forms subpart covered in this iteration of FN3, i.e., the automatic allowable limits evaluation in Function F3B is ended) = P21.

STEP F3B-16

- P17: Identify the ID5 on the DS18 data from P15.
- P18: Locate the DS17 data for the ID5 from P17.
- P19: Is the DS17 data P17 for an allowable limits specification that must be manually checked (i.e., the user must evaluate whether the allowable limits specifications have been met because the type of allowable limits specification is such that it does not fit the format for allowable limits specification data and, therefore, cannot be evaluated automatically)? Yes (i.e., it is not possible to automatically evaluate the allowable limits in Function F3B; an allowable limits check (Function F3C) must be conducted) = P21; No = P20
- P20: Add the ID22 for this iteration of FN3 to a list, called the P20 list; retain throughout Function F3B.
- P21: NEXT FN3; end of FN3, GO TO P22.
- P22: GO TO P1 of Step F3B-17.
- P23: Erase the DS22 data with the ID18 from R1.
- P24: End of Function F3B; close out and exit to the appropriate Menu '0' (First Level Menu) as determined by the CT1 from R2.

OUTPUTS AND GENERATION OF DATA SETS: None

### FUNCTION 3D

#### Function For Cancelling The Monitoring Of Outstanding (Uncompleted) OHMIS Forms

(Functional Data Flow)

The OHMIS system monitors all blank forms generated (Function F3A) for the purpose of data entry until these forms are completed and the data is entered. Function F3D allows the user to indicate that an outstanding (uncompleted) form is not going to be submitted. This then cancels the monitoring of the unsubmitted form.

#### SUMMARY OF SUBFUNCTIONS:

The following are the subfunctions to be accomplished under this OHMIS function:

1. Program cancels the outstanding (uncompleted) forms monitoring data (DS22) for a form that the user has indicated is not going to be submitted.
2. If the unsubmitted form is a Missing Data Element Type Form, the program changes the missing data element type information (DS19) to reflect that there is no longer an outstanding data request (form) for the missing data element types that were on the Missing Data Element Type Form, i.e., these data element types are now eligible for entry on a new Missing Data Element Type Form.

TRIGGERING STEPS IN THIS FUNCTION: None

### STEP F3D-1

Identify the form that the user wishes to cancel. Determine if this form is being monitored.

PREVIOUS STEP: None. Step F3D-1 occurs when the user decides to cancel an outstanding (uncompleted) OHMIS form and indicate that the form is not going to be submitted.

INPUTS (S = Selection; Q = Query (not stored); E = Entry (stored); R = Retrieval):

#### Menu Selection and Input Sequence:

- S1: 3 (completed forms data and uncompleted forms data)
- S2: 6 (cancelling an outstanding (uncompleted) form, i.e., indicating that an outstanding form is not going to be submitted)
- Q1: Completed form identifier (ID18) for the form that is not going to be submitted. This identifier is printed on the form (see Output O12) when it is generated. Query is in P1.

#### Data Retrievals:

- R1: OHMIS user type code (CT1) from P2 of Step F1A-2
- DS22: Outstanding (uncompleted) forms monitoring data

#### PROCESSING (P = Process substep):

- P1: Ask user for Q1, i.e., ID18. Retain this ID18 throughout Function F3D.
- P2: Is there a set of DS22 data for the ID18 from P1? Yes = P5; No = P3
- P3: Tell user that this form was not being monitored.
- P4: End of Function F3D. Close out all temporary files unless an exit to the appropriate Menu '0' (First Level Menu) as determined by the CT1 from R1.
- P5: GO TO P1 of Step F3D-2.

OUTPUTS AND GENERATION OF DATA SETS: None

## STEP F3D-2

Determine if the form that the user wishes to cancel is a Missing Data Element Type Form. If not, proceed to Step F3D-3. If yes, remove the completed form identifier (ID18) from each set of missing data element information (DS19) for the missing data elements covered on the form. This indicates that the data element type is no longer being requested on a Missing Data Element Type Form and, therefore, is eligible to be put on a new Missing Data Element Type Form (see Function F3A).

PREVIOUS STEP: Step F3D-2 follows P5 of Step F3D-1.

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

R1: Completed form identifier (ID18) for the form the user wishes to cancel. Retained in P1 of Step F3D-1.

DS19: Missing data element information

DS22: Outstanding (uncompleted) forms monitoring data

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

P1: Locate the DS22 data for the ID18 for R1.

P2: Is the DS22 data from P5 for an Missing Data Element Type Form? Yes = P4; No = P3

P3: GO TO P1 of Step F3D-3.

P4: Make a temporary list of each of the missing data element type information identifiers (ID21) on the DS22 data from P1. This is called the P4 list.

FN1: FOR each ID21 on the P4 list:

P5: Locate the DS19 data for the ID21.

P6: Remove the ID18 from R1 from the DS19 data located in P5, i.e., remove the identifier indicating that this missing data element is currently being requested on a Missing Data Element Type Form.

P7: NEXT FN1; end of FN1, GO TO P3.

OUTPUTS AND GENERATION OF DATA SETS: None

### STEP F3D-3

Delete the outstanding (uncompleted) forms monitoring data (DS22) for the form that the user wishes to cancel.

PREVIOUS STEP: Step F3D-3 follows P3 of Step F3D-2.

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

- R1: Completed form identifier (ID18) for the form the user wishes to cancel. Retained in P1 of Step F3D-1.
- R2: Current date
- DS22: Outstanding (uncompleted) forms monitoring data
- DL26: List of new outstanding data requests (ID18) (not overdue) by OHMIS service area (ID10)
- DL27: List of outstanding data requests (ID18) (no due date specified) by OHMIS service area (ID10)
- DL28: List of overdue data requests (ID18) by OHMIS service area (ID10)

PROCESSING (P = Process Substep):

- P1: Locate the DS22 data for the ID18 from R1. Identify the OHMIS service area identifier (ID10) on this DS22 data.
- P2: Does the DS22 data from P1 specify an amount of time from the date that the form was generated before the form is considered to be overdue? Yes = P5; No = P3
- P3: Locate the ID18 from R1 and the ID10 from P1 on the DL27 list. Delete the ID18 and ID10 from this list.
- P4: GO TO P10.
- P5: Calculate the past due date for the form, i.e., add the amount of time before the form is overdue given on the DS22 data from P1 to the date that the form was generated, also given on the DS22 data from P1.
- P6: Is the past due date from P5 equal to or later than the current date in R2? Yes = P7; No = P9
- P7: Locate the ID18 from R1 and the ID10 from P1 on the DL28 list and delete the ID18 and ID10 from the list.

STEP F3D-3

P8: GO TO P10.

P9: Locate the ID18 from R1 and the ID10 from P1 on the DL26 list and delete the ID18 and ID10 from this list.

P10: Delete the DS22 data from P1.

P11: GO TO P4 of Step F3D-1.

OUTPUTS AND GENERATION OF DATA SETS: None



## FUNCTIONAL DATA FLOWS

### FOR THE F4 FUNCTIONS: Scheduling Functions

These Functional Data Flows describe the processing substeps for scheduling and rescheduling of tasks in OHMIS. All types of tasks are scheduled using the same program logic. Examples of tasks that might be scheduled include the conducting of medical examinations, conducting of industrial hygiene surveys, follow up on hazards identified or corrective actions previously found to be needed, etc.

The processing steps given here describe the automatic scheduling of OHMIS tasks. A task is initiated when the OHMIS program triggers a requirement (or Reminder Notice) that involves the performance of a "scheduleable" action. (An "unscheduleable" action is defined in the description of the requirement description data set (DS1).) That is when the OHMIS programs (Functions F1B, F2A or F3B) determine that a requirement should be executed (i.e., the information, date or allowable limit previously defined as necessitating the execution of an action is input or reached), the program checks the requirement description data (DS1) to determine if this requirement involves the execution of a scheduleable task. (In the case of a Reminder Notice (non-requirement type of date triggered action, the suspense data (DS4) is checked to determine if there is a scheduleable task involved.) If the DS1 data (or DS4 data) specifies a scheduleable task (through the use of a task type code (CT8)), the OHMIS program, in Function FA, automatically (i.e., without any action required by the user) schedules the task.

The F4 Functions, therefore, make the OHMIS core data processing programs an independent and "self-sufficient" hole. The entire process of executing an occupational health program---from the initial recognition of a need for action based on a specified requirement, through the identification of the personnel and time needed to schedule the task involved in complying with the requirement, to the monitoring of the execution of these tasks/requirements---is contained in the OHMIS core data processing functions. Moreover, from the standpoint of the OHMIS user at the local installation level, this entire process is accomplished without the need for any intervention or self-initiated action on the part of the user, other than the entering of the OHMIS data (always done in a standard way) that will trigger the initiation of the process of executing an occupational health program.

There are three F4 Functions. Function F4A (called the scheduling function) schedules tasks. Function F4B (called the rescheduling function) allows the user to input data affecting the scheduling of tasks (such as what time each employee who will be performing tasks has available for scheduling) and identifies those tasks that need to be rescheduled, because of the changes in this data. Function F4C (called the Function for Routine Generation of Tentative Monthly

### FUNCTIONAL DATA FLOWS

Schedule Availability Data) uses the standard regular weekly schedule availability information about the availability of each employee who will perform tasks to generate a tentative "blank" monthly schedule of time available for scheduling tasks.

## FUNCTION F4A

### Scheduling Function

(Functional Data Flow)

This Functional Data Flow describes the processing necessary to schedule tasks in OHMIS. The task scheduled in Function F4A are divided into two groups: 'Employee transport' tasks and all other tasks. Employee transport tasks are distinguished primarily by the fact that they require transporting of an employee away from his work site in order to perform the task. The task of performing a medical examination is one of the most common examples of an employee transport task. In this case, the employee who is participating in the task (e.g., is having a medical examination) as distinguished from the employee who performs the task (e.g., the physician conducting the medical examination) must be transported (or at least removed from) his/her regular work site to participate in the examination (task). Employee transport tasks are scheduled in Steps F4A-3 through F4A-5; the other tasks are scheduled in Steps F4A-6 and F4A-7.

Employee transport tasks are given special treatment in the scheduling programs for two reasons:

- 0 The program attempts to reduce the number of times that an employee must be transported away from his work in order to participate in the occupational health program. This is done by scheduling employee transport tasks for the same employee at approximately the same time. The reduction in the number of times that the employee is contacted by OHMIS to a degree that requires participation in the occupational health program away from his regular work site, is considered to be critical. This is because the OHMIS program is designed to allow for (but not necessarily prescribe) more frequent interaction between employees and the Department of the Army's occupational health program, by providing a means to trigger and monitor all of the requirements of an "ideal" occupational health program. It is expected that if such an "ideal" occupational health program were implemented the total number of contacts with employees would increase substantially beyond the number of contacts currently made in the Department of the Army's occupational health program. To allow for this to occur, while still minimizing the burden on the work force of participating in such a program, the OHMIS scheduling program has many additional features that allow for tasks involving the same employee to be scheduled at approximately the same time. For example, the criticality of this scheduling selection criteria is considered so important that the program will reschedule already scheduled tasks in order

#### FUNCTION F4A

to optimize the frequency with which an employee must participate in employee transport tasks as a part of the occupational health program.

- 0 An employee transport task, by definition, necessarily involves the scheduling of two persons, i.e., both the persons performing the task (e.g., the physician conducting the medical exam) and the persons participating in the task (e.g., the person receiving a medical examination). This means that the scheduling program must be designed so that multiple tasks are not scheduled to overlap with other tasks that are either performed by the same person or tasks in which the same person will participate.

These two stipulations for scheduling selection criteria for employee transport tasks add greatly to the complexity (i.e., the number of processing substeps) of the scheduling programs.

The OHMIS scheduling program is designed to schedule tasks based on certain scheduling selection criteria. Thus, the program does not merely look for an "open" time slot to schedule the task, but also schedules tasks so that:

- 0 Tasks are performed only by persons designated as being qualified to perform the task
- 0 The tasks are not interrupted by the performance of any other task
- 0 The tasks are not scheduled during any time period that is restricted for the task or for the requirement implementation unit (e.g., employee) participating in the task. For example, the OHMIS scheduling program assumes a 24-hour, 7-day a week "working" shift and identifies those times that persons are not available to perform or participate in tasks because these times are not a part of their regular working hours. These times are called "restricted" times, because they are times for which it is not acceptable to schedule a task. These restricted times can be standard restricted times (e.g., work shift, lunch breaks, etc.) or special restricted times (e.g., leave times). Similarly, the program identifies those times that facilities (and other requirement implementation units that are the unit about which a task is scheduled) are not available for scheduling tasks. For example, there may be times when a facility is closed down and cannot be opened to conduct an industrial hygiene survey. These times would be considered restricted times for conducting tasks involving that facility, i.e., conducting tasks in which that facility was the requirement implementation unit.

#### FUNCTION F4A

In addition to the complexity added by distinguishing employee transport tasks, the OHMIS scheduling program is made more powerful by the fact that it attempts to not merely schedule a task, but to optimize the scheduling of the task. By optimization it is meant that the program attempts to find the best scheduling option available for the task. The optimization process is based on several scheduling selection criteria, including:

- o Scheduling tasks "next to" (i.e., at approximately the same time) other similar tasks. This includes not only optimizing the number of employee transport tasks that are scheduled next to other employee transport tasks for the same employee but also optimizing the frequency with which the employees performing the tasks must change facilities to perform a task. The OHMIS scheduling program attempts to schedule all tasks that are to be conducted in the same facility at approximately the same time. Also, tasks involving the same requirement implementation units (e.g., the same hazard, job class, organizational unit, etc.) will be scheduled at approximately the same time, if possible.
- o Scheduling tasks so that they are started as early as possible and end before the due date for the task (if any).
- o Scheduling tasks so that there are the lowest number of interruptions (e.g., breaks for lunch, etc.) in the execution of the task.
- o Scheduling tasks in accordance with the preferred time use of the performer of the task. The OHMIS program allows employees who will be performing tasks (e.g., occupational health nurses, industrial hygiene specialists, etc.) to specify their preferred use of their time. For example, if a performer wishes to conduct industrial hygiene surveys or other field work on Mondays, Wednesdays and Fridays and conduct office/paper work on Tuesdays and Thursdays, this can be specified and the OHMIS program will attempt to schedule the tasks in accordance with these preferences.

As may be apparent, there may be conflicts in the above criteria for scheduling tasks. For example, there may be no time available (among persons qualified to perform a task) that is the type of time use that is needed for a task, except time after the due date for the task. The conflict, in this example, would be whether the program should schedule the task after the due date or schedule the task not in accordance with the preferred time use. Because of these conflicts, the OHMIS scheduling program "optimize" the scheduling of tasks. This is done by reviewing all options for scheduling a particular task and determining which option has the best characteristics according to

#### FUNCTION F4A

the priority given to each of the scheduling selection criteria. This means that the program may make several "tries" to schedule a task before it "finds" the best scheduling option.

#### SUMMARY OF SUBFUNCTIONS

The following are the subfunctions to be accomplished under this OHMIS function:

1. The program identifies a series of time slots that are available for scheduling a task. It then determines what are the characteristics of these time slots (e.g., dates, preferred time use, etc.). The program then evaluates these time slots characteristics to determine if they meet the criteria for a "ideal" scheduling option. If they do, this scheduling option is used. If not, the program continues to look for other scheduling options until an ideal option is found or until all options have been exhausted. At that point, the best of the scheduling options identified is chosen.
2. The program generates Scheduling Notices (015) informing participants in the task of the date and time for the task.

TRIGGERING STEPS IN THIS FUNCTION: None

#### STEP F4A-1

Begin generation of specific task scheduling data (DS24) for the tasks that need to be scheduled and have not been scheduled before. Compile a list of all tasks that currently need to be scheduled for the OHMIS service area from the list of tasks that need to be scheduled (DL35), the list of tasks that previously could not be scheduled (DL31) and the tasks that have been previously identified (in the rescheduling function, i.e., Function F4B) as needing to be rescheduled (DL39).

PREVIOUS STEP: Step F4A-1 follows P40 of Step F1A-3.

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

- R1: OHMIS service area identifier (ID10) retained in P5 of Step F1A-2
- R2: Next available task identifier(s) (ID23)
- R3: Next available weekly schedule identifier(s) (ID28)
- DS1: Requirement description data
- DS3: (Information triggered) Requirements applicability data
- DS4: Requirements suspense data, i.e., date triggered requirements applicability data
- DS5: Requirements implementation data
- DS17: Allowable limits specification data
- DS23: Task description data
- DS25: Facility data by task type
- DS28: Contact and location data
- DL31: List of task identifiers (ID23) for tasks that cannot be scheduled by OHMIS service area (ID10)
- DL35: List of requirement implementation identifiers (ID9) for requirements having tasks that need to be scheduled by OHMIS service area (ID10)

STEP F4A-1

- DL36: List of requirement implementation units (or sets of units) linked to their corresponding task identifier (ID23), OHMIS service area identifier (ID10) and whether the task is an 'employee transport' type of task
- DL37: List of the task identifier (ID23) by the main facility identifier (ID8) in which the task will take place and by its OHMIS service area (ID10)
- DL38: List of task identifiers (ID23) by requirement implementation identifier (ID9) and by OHMIS service area (ID10)
- DL39: List of task identifiers (ID23) for tasks that need to be rescheduled by OHMIS service area (ID10)

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

- P1: Are there any requirement implementation identifiers (ID9) on the DL35 list for the OHMIS service area (ID10) from R1? Yes = P2; No = P12
- P2: Put the ID9s on the DL35 list for the ID10 from R1 on a temporary list called the P2 list.
- FN1: FOR each ID9 on the P2 list:
- P3: Locate the DS5 data corresponding to the ID9; locate the requirement identifier (ID6) on this DS5 data; locate the DS1 data corresponding to this ID6; locate the task type code (CT8) on this DS1 data; locate the DS23 data corresponding to this CT8. Also locate the requirement application identifier (ID5) on the DS5 data and locate the requirement applicability data (DS3, DS4 or DS17) corresponding to this ID5. Also identify the DS25 data, if any, corresponding to the CT8 identified above.
- P4: Using the DS25 data and the DS23 data from P3 for this iteration of FN1, generate a set of DS24 data. Assign the task identifier (ID23) from R2. The date the DS24 data was generated should be the same as the date that the DS5 data from P3 for this iteration of FN1 was generated. The OHMIS service area identifier (ID10) and the requirement implementation units come from the DS5 data from P3. The task type code (CT8), time use code (CT11) and standard time slots required to complete the task are from the DS23 data from P3 for this iteration of FN1. The user specified time slots required to complete the task should be the same as the standard time slots required to



#### STEP F4A-1

complete the task at this point in the program (because the user has not yet specified any difference between the standard time slots required and the user specified time slots required). The ID9 assigned to the DS24 data should be the ID9 for this iteration of FN1. Whether the task is for a 'requirement' that is mandatory or a recommendation is from the DS2 data from P3. The due date and whether the task was triggered by a Reminder Notice type of suspense requirement is from the DS4 data from P3 of this iteration of FN1, if this task was triggered by suspense type (DS4) requirement applicability data. If the requirement was not a DS4-triggered requirement, the due date is from the DS23 data from P3. The facility identifier (ID8) is from the DS25 data from P3, if any; or, it is the same as the ID8 that is one of the requirement implementation units for the task, if one of the requirement implementation units is a facility; or, it is from the DS28 data for the employee job class or organizational unit that is one of the requirement implementation units for the task, if any; or, if none of these sources are available, this field is left blank. If the DS28 data indicates that there are standard (weekly schedule) restrictions on the time that this task can be scheduled, generate a set of DS26 data based on the data in the DS28 data located in P3 and place the weekly schedule identifier (ID28) for this new DS26 data, i.e., the ID28 from R3, on the new DS24 data. Answer the question about whether the task has been scheduled as 'No'. Put a code of 'D' (not yet attempted to schedule) in answer to the question on the DS24 data about whether this task has been scheduled. The rest of the data elements on the new DS24 data are left blank at this time.

- P5: Remove the ID9 for this iteration of FN1 from the DL35 list.
- P6: Add the ID23 and the ID10 assigned to the DS24 data generated in P4 and the ID9 for this iteration of FN1 to the DL38 list.
- P7: Determine from the DS23 data from P3 for this iteration of FN1 whether this task is an 'employee transport' type of task. Add the ID23 and the ID10 assigned to the DS24 data generated in P4, the requirement implementation units, and whether the task is an 'employee transport' type of task (answer: Yes/No) in the new DS24 data generated in P4 to the DL36 list.
- P8: Add the CT8 from P3 and the ID23 assigned to the new DS24 data to the DS5 data located in P3.

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- P9: Add the ID23, ID10 and ID8, if any, assigned to the new DS24 data generated in P4 to the DL37 list.
- P10: Put the ID23 assigned in this iteration of FN1 on a temporary list called the P10 list. Retain this list throughout Function F4A.
- P11: NEXT FN1; end of FN1, GO TO P12.
- P12: Are there any task identifiers (ID23) on the DL31 list for the OHMIS service area (ID10) from R1? Yes = P13; No = P14
- P13: Add each of the ID23s on the DL31 list for the ID10 from R1 to the P10 list.
- P14: Are there any ID23s on the DL39 list for the ID10 for the OHMIS service area (ID10) from R1? Yes = P15; No = P21
- P15: Put the ID23s on the DL39 list for the ID10 from R1 on the P10 list.
- P16: GO TO P1 of Step F4A-2.

OUTPUTS AND GENERATION OF DATA SETS:

- DS24: Specific task scheduling data
- DS26: Regular weekly schedule availability data (for the regular weekly schedule during which a task cannot be scheduled, i.e., the regular weekly restrictions for the task)

## STEP F4A-2

For each of the tasks identified in Step F4A-1 as currently needing to be scheduled, identify those that are scheduleable, i.e., those for which there are persons qualified to perform the task in the OHMIS service from which the task originated. For the scheduleable task, determine if the task is an 'employee transport' type of task. If 'Yes', continue. If 'No', go to Step F4A-6.

Employee transport tasks are tasks that require "transporting" an employee from his/her regular work site to perform the task. An example of such a task is a task involving medical surveillance of an employee. In order to reduce the number of times that employees are "transported", Function 4A attempts to schedule all employee transport tasks for the same employee at the same time. This involves identifying the groups of tasks that include: 1) all employee transport tasks that are currently being scheduled (i.e., those identified in Step F4A-1) that are for the same employee; 2) all employee transport tasks that have already been scheduled for the same employee; and, 3) all future OHMIS requirements that will result in the scheduling of an employee transport task, i.e., all future scheduled tasks for the same employee.

Step F4A-2 generates temporary lists (referred to P24 lists). Each list contains the information about the set of tasks that all belong to the same group, i.e., the set of employee transport tasks for the same employee that are either currently being scheduled, already scheduled or will be scheduled in the near future (within 90 days). The scheduling of the group of tasks on the P24 list is done in Step F4A-3, if the group includes already scheduled tasks; in Step F4A-5, if there is only one task in the group (i.e., there are no "already scheduled" or "future scheduled" employee transport tasks for the same task that is currently being scheduled; and, therefore, it is not necessary to schedule the task next to any other task); or, in Step F4A-4, for all other groups of tasks.

PREVIOUS STEP: Step F4A-2 follows P16 of Step F4A-1.

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

R1: The list of task identifiers (ID23) for the tasks that currently need to be scheduled; from the list generated in P10 of Step F4A-1

R2: Current date

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- R3: The date that is one quarter (90 days) later than the current date (R2)
- DS1: Requirement description data
- DS4: Requirements suspense data, i.e., date triggered requirements applicability data
- DS5: Requirements implementation data
- DS23: Task description data
- DS24: Specific task scheduling data
- DS25: Facility data by task type
- DS28: Contact and location data
- DL31: List of task identifiers (ID23) for tasks that cannot be scheduled by OHMIS service area (ID10)
- DL32: List of the employee identifier (ID4) that is one of the requirement implementation units by the corresponding requirement application identifier (ID5) and OHMIS service area identifier (ID10), for those ID5s that identify requirements suspense data sets (DS4) that will trigger an 'employee transport' type of task
- DL34: List of qualified employee identifiers (ID4) by task type (CT8) and by OHMIS service area (ID10)
- DL36: List of requirement implementation units (or set of units) linked to their corresponding task identifier (ID23), OHMIS service area identifier (ID10) and whether the task is an 'employee transport' type of task

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

- P1: Generate a copy of the R1 list, i.e., the list of tasks that are to be scheduled in this execution of Function F4A. This is called the P1 list. Retain the P1 list throughout Step F4A-2.
- FN1: FOR each of the task identifiers (ID23) on the P1 list:
- P2: Locate the DS24 data corresponding to the ID23. Locate the task type code (CT8) and the OHMIS service area identifier (ID10) on this DS24 data.

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- P3: Are there any employee identifiers (ID4) on the DL34 list for the CT8 and ID10 from P2? Yes = P9; No (i.e., this task is not scheduleable, because there are no persons qualified to perform the task in the OHMIS service area in which the task originated) = P4
- P4: Remove the ID23 for this iteration of FN1 from the P1 list. Fill in the DS24 data from P2 to indicate that this task cannot be scheduled because of the lack of qualified persons. This is done by entering the code of 'A' on the DS24 data.
- P5: Place the ID23 for this iteration of FN1 on a list called the P5 list. Retain the P5 list throughout Function F4A.
- P6: Is the ID23 for this iteration of FN1 and the ID10 from P2 on the DL31 list? Yes = P9; No = P7
- P7: Add the ID23 for this iteration of FN1 and the ID10 from P2 to the DL31 list.
- P8: GO TO P13 (next FN1).
- P9: Locate the DS23 data for the CT8 from P2.
- P10: Does the DS23 data from P9 indicate that this is an 'employee transport' task? Yes = P13 (next FN1); No = P11
- P11: Remove the ID23 for this iteration of FN1 from the P1 list.
- P12: Add the ID23 for this iteration of FN1 to the list, called the P12 list. Retain the P12 list throughout Function 4A.
- P13: NEXT FN1; end of FN1, GO TO P14.
- P14: Are there any ID23s still on the P1 list? Yes = P20; No = P15
- P15: Are there any ID23s on the P12 list? Yes = P16; No = P17
- P16: GO TO P1 of Step F4A-6.
- P17: End of Function F4A; close out and erase all temporary lists and records from Function F4A.
- P18: GO TO P41 of Step F1A-3.
- P19: Erase the P1 list. GO TO FN2 (P22).
- P20: Copy the ID23s remaining on the P1 list onto a list called the P20 list. The P20 list is the list of scheduleable employee transport tasks that currently need to be

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scheduled, i.e., that need to be scheduled in this execution of Function 4A.

P21: Retain the P20 list throughout Step F4A-2. GO TO P19.

FN2: FOR each ID23 on the P20 list:

P22: Locate the DS24 data corresponding to the ID23. Locate the task type code (CT8) on this DS24 data. Locate the DS23 data corresponding to this CT8. Also, locate the requirement implementation identifier (ID9) on the DS24 data; locate the DS5 data corresponding to this ID9; locate the requirement application identifier (ID5) on this DS5 data.

P23: Using the DS24 data from P22, identify the OHMIS service area identifier (ID10), requirement implementation unit(s) (including the employee identifier (ID4) that must be one of the requirement implementation units, because this is an 'employee transport' type of task), the time use code (CT11), the facility identifier (ID8), if known, and the user specified number of time slots required to complete the task, for the task in this iteration of FN2.

P24: Begin generating a temporary list, called the P24 list. (Generate a new such P24 list for each FN2; do not erase previous P24 lists generated in other iterations of FN2; retain the P24 lists throughout Function 4A.) Label this P24 list with the ID23 from this iteration of FN2. Each entry on the P24 list will consist of the following 11 data elements:

- (1) A task identifier (ID23).
- (2) A code (1-3) indicating whether this task is one currently being scheduled (Code '1'), one already scheduled (Code '2'), or one that will be scheduled in the future (Code '3').
- (3) A requirement application identifier (ID5). If the task is to be scheduled in the future (Code '3' in data element (2)), leave data element (1) blank and put in data element (3), the ID5 for the DS4 data that will eventually trigger the task (i.e., the ID5 from DL32). For the other tasks (i.e., for the currently being scheduled tasks and the already scheduled tasks (Code '1' and '2', respectively in data element (2)) put in data element (3) the ID5 of the requirement applicability data (DS3, DS4, or DS17) that triggered the requirement that initiated the task. This ID5 is from the DS5 data that is identified by the requirement implementation

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identifier (ID9) that is on the DS24 data identified by the ID23 in data element (1).

- (4) Limiting dates and times, if any, for the task:
- (a) The due date, if any, for the task. This is from the DS24 data corresponding to the ID23 in data element (1) (for currently being scheduled and already scheduled tasks, i.e., code '1' and '2' in data element (2)) or from the DS4 data referenced by the ID5 in data element (3) (for future scheduled (code '3' in data element (2)) tasks).
  - (b) Whether there are any restrictions on the task; if so, whether the restrictions are standard, special or both; and, the weekly schedule identifier (ID28) identifying the DS26 for the standard restrictions, if any, from the DS24 data for code '1' and code '2' tasks. Code '3' tasks (future scheduled) can only have standard restrictions. The ID28 for the standard restrictions, if any, is from the DS28 data, if any, for the employee identifier (ID4) that is one of the requirement implementation units for the task. (Requirement implementation units for future scheduled tasks are from the DS4 data that is identified by the ID5 in data element (3)).
- (5) The OHMIS service area identifier (ID10) for the task. From the DS24 data corresponding to the ID23 in data element (1) for tasks with code '1' and '2' in data element (2). From the DS4 data that will trigger the task (i.e., the DS4 data with the ID5 in data element (3)) for future scheduled tasks (code '3' in data element (2)).
- (6) The task type code (CT8) for the task. From the DS24 data for the ID23 in data element (1) for currently scheduled and already scheduled tasks. From the DS1 data for the requirement identifier (ID6) that is on the DS4 data that will eventually trigger the task (as identified by the ID5 in data element (3)) for future scheduled tasks.
- (7) The time use code (CT11) for the task. From the DS23 data corresponding to the task type code (CT8) in data element (6).
- (8) The facility identifier (ID8) in which the task will be conducted, if known. From the DS24 data for

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the ID23 in data element (1) for currently being scheduled and already scheduled tasks. For future scheduled tasks, the ID8 is from the DS25 data for the CT8) from DE (6); or the ID8 that is one of the requirement implementation units for the task; or, the DS28 data for the employee identifier (ID4) that is one of the requirement implementation units for the task. (Requirement implementation units for future scheduled tasks are from the DS4 data that is identified by the ID5 in data element (3)).

- (9) The number of time slots required to complete the task. For currently being scheduled tasks (code '1' in data element (2)) use the user specified number of time slots required to complete the task from the DS24 data for the ID23 in data element (1). For the future scheduled task (code '3' in data element (3)) use the standard number of time slots required to complete the task from the DS23 data corresponding to the task type code (CT8) in data element (6).
- (10) If the task is an already scheduled task (code '2' in data element (2)), the following 5 additional data elements, all from the DS24 data corresponding to the ID23 in data element (1), should be included on the P24 list:
  - (a) The time slot information for the start time for the task. Time slot information consists of 6 parts: (1) a monthly schedule identifier (ID27), (2) year, (3) month (1-12), (4) date (1-31), (5) time slot number (number from '1' to '96' indicating the quarter of an hour period during a day), and (6) day of the week (1-7). (Note: Parts (2), (3) and (6) are from the DS27 data corresponding to the ID27 in part (1)).
  - (b) The time slot information for the end time for the task.
  - (c) Whether the task was scheduled within the due date for the task
  - (d) Time use code (CT11) under which the task was scheduled
  - (e) Whether the user specified the schedule for the task
- (11) A code (1-99) indicating to which set of qualified users who can perform the task the task belongs.



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Arbitrary number, temporarily assigned, in order to group the tasks on the P24 list by common sets of user(s) qualified to perform the task.

- P25: Put the label of the P24 list (i.e., the ID23 for this iteration of FN2) on a temporary list, called the P25 list. This is the list of labels for all P24 lists. The P24 lists are the groups of employee transport tasks that are for the same employee. Each P24 list consists of at least one task that is currently being scheduled. The list may also contain other employee transport tasks for the same employee that are currently being scheduled, already scheduled, or going to be scheduled in the near future. The P24 lists are used to enable scheduling employee transport tasks for the same employee as a group, i.e., to enable scheduling all employee transport tasks for an employee at the same time, if possible.
- P26: Put the information about the task for this iteration of FN2 as the first entry (i.e., the first set of 11 data elements) on the P24 list generated for this iteration of FN2. The data element (1) should be the ID23 for this iteration of FN2. Data element (2) should be the code '1' (currently being scheduled). The task type code (CT8), i.e., data element (6) and the requirement application identifier (ID5), i.e., data element (3) are from P22. Leave data element (10) and (11) blank. The rest of the data elements on the P24 list entry come from the data located in P23.

### FN2.1: FOR each ID23 on the DL36 list:

- P27: Is this ID23 the same as the ID23 for this iteration of FN2 (i.e., there is already a P24 list entry for this task)? Yes = P35; No = P28
- P28: Is the ID23 for this iteration of FN2.1 on the P5 list (i.e., the list of tasks newly determined (in this execution of Function 4A) to be unscheduleable, because there are no persons qualified to perform the task in the OHMIS service area in which the task originated)? Yes = P39 (next FN2.1); No = P29
- P29: Is the ID23 for this iteration of FN2.1 for an employee transport type of task? (Note: This information is given on the DL36 list entry.) Yes = P30; No = P39 (next FN2.1)
- P30: Does the ID23 for this iteration of FN2.1 have the same OHMIS service area (ID10) and have the same employee identifier (ID4) as one of its requirement implementation units (as shown on the DL36 list entry) as the task in

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this iteration of FN2 (as identified in P23)? Yes = P31;  
No = P39 (next FN2.1)

- P31: Locate the DS24 data corresponding to the ID23 in this iteration of FN2.1. Identify the task type code (CT8) on this DS24 data. Locate the DS23 data for this CT8. Also locate the requirement implementation identifier (ID9) on the DS24 data; locate the DS5 data corresponding to this ID9; locate the requirement application identifier (ID5) on this DS5 data. Also, use this DS24 data to identify the OHMIS service area (ID10), the requirement implementation units (including the employee identifier (ID4)), the time use code (CT11), due date (if any), facility identifier (ID8) (if known) and the user specified number of time slots required to complete the task, for the task in this iteration of FN2.1.
- P32: Put the information about the task in this iteration of FN2.1 onto the most recently generated P24 list (i.e., the P24 list generated in this iteration of FN2). Data element (1) on the P24 list is the ID23 for this iteration of FN2.1. Leave data elements (2), (10), and (11) blank. The rest of the data elements are from P31.
- P33: Is the ID23 for this iteration of FN2.1 on the P20 list? Yes (i.e., this task is currently being scheduled) = P34; No = P37
- P34: Fill data element (2) of the last entry made (i.e., the entry made in this iteration of FN2.1) to the P24 list for this iteration of FN2 with the code '1' (currently being scheduled).
- P35: Erase the ID23 for this iteration of FN2.1 from the P20 list.
- P36: GO TO P39 (next FN2.1).
- P37: Fill data element (2) of the last entry made (i.e., the entry made in this iteration of FN2.1) to the P24 list for this iteration of FN2 with the code '2' (already scheduled).
- P38: Fill in data element (10) of the last entry made (i.e., the entry made in this iteration of FN2.1) to the P24 list for this iteration of FN2. Use the DS24 data obtained in P31.
- P39: NEXT FN2.1, end of FN2.1, GO TO FN2.2 (P40).
- FN2.2: FOR each of the requirement application identifiers (ID5) on the DL32 list:

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- P40: Are the employee identifier (ID4) and the ID10 for the DL32 list entry for this iteration of FN2.2 (as shown on the DL32 list entry) the same as the ID4 and ID10 for this iteration of FN2 (as identified in P23)? Yes = P41; No = P47 (next FN2.2)
- P41: Is the ID5 for this iteration of FN2.2 contained in data element (3) on one of the entries on the P24 list for this iteration of FN2? Yes = P47 (next FN2.2); No = P42
- P42: Locate the DS4 data corresponding to the ID5 for this iteration of FN2.2. Identify the requirement implementation unit(s) and OHMIS service area identifier (ID10) on this DS4 data.
- P43: Examine the 'next suspense date' on the DS4 data from P42. Derive the date that is equal to the 'prior notification time', if any, on the DS4 data added to the 'next suspense date'. The date thus generated is the due date for the requirement (and task) triggered by this DS4 data. Is this due date calculated in P43 equal to or earlier than the R3 date, i.e., is the task for this DS4 data going to be due within the next 90 days? Yes (i.e., the task for this DS4 data is going to be triggered in the near future and therefore, this task is considered a 'future scheduled task' and, because it is an 'employee transport' task (otherwise it would not have been on the DL32 list), it should, if possible, be scheduled with the other tasks for the same employee that are currently being scheduled) = P45; No = P47 (next FN2.2)
- P44: Identify the OHMIS service area identifier (ID10) on the DS4 data from P42. Also identify the requirement identifier (ID6) on the DS4 data from P42. Locate the DS1 data corresponding to this ID6. Identify the task type code (CT8) on this set of DS1 data. Are there any employee identifiers (ID4) on the DL31 list for this ID10 and CT8? Yes = P45; No = P47 (next FN2.2)
- P45: Locate the DS23 data for the CT8 identified in P44. Locate the DS25 data, if any, corresponding to the CT8; identify the facility identifier (ID8) on this DS25 data. If no DS25 data, locate the facility identifier (ID8), if any, that may be one of the requirement implementation units located in P42. If the requirement implementation units do not include an ID8, locate the DS28 data, if any, for the employee identifier (ID4) that must be one of these units and locate the ID8 on this DS28 data. If no DS28 data, the ID8 is not known for the task that will be triggered by the requirement applicability (ID5) in this iteration of FN2.2.

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P46: Put the information about the requirement applicability (ID5) in this iteration of FN2.2 onto the most recently generated P24 list (i.e., the P24 list generated in this iteration of FN2). Data element (1) should be left blank; at this point this future schedule "task", has not yet become a task (i.e., there is no DS24 data and therefore no task identifier (ID23) for the task; at this point, the future scheduled "task" is simply a specification for determining the applicability of a requirement (i.e., DS4 data with a requirement application identifier (ID5)) from which the task data (DS24) will be generated. Data element (2) should be filled with the code '3' (future scheduled task). Data element (3) is the ID5 for this iteration of FN2.2. The due date (data element (4)) is from P43. The OHMIS service area identifier (ID10), i.e., data element (5), is from P44. The task type code (CT8), i.e., data element (6), is from P44. The time use code (CT11), i.e., data element (7) and the standard number of time slots required to complete this task, i.e., data element (9), are from the DS23 data located in P45. Data elements (10) and (11) are left blank.

P47: NEXT FN2.2; end of FN2.2, GO TO P48.

P48: NEXT FN2; end of FN2, GO TO FN3 (P49).

FN3: FOR each ID23 on the P25 list (i.e. the list of labels for P24 lists):

P49: Locate the P24 list with the ID23 for this iteration of FN3 as its label.

P50: Store the value '1'.

FN3.1: FOR each entry (i.e., each set of 11 data elements on a task) on the P24 list from P49:

P51: Identify data element (6), i.e., the task type code (CT8) on the entry. Also identify data element (5), i.e., the OHMIS service area identifier (ID10) on the entry.

P52: Using the DL34 list, identify all of the employee identifiers (ID4) for the same CT8 and ID10 as those identified in P51. Put these ID4s on a temporary list called the P52 list.

P53: Are there any P54 temporary lists? Yes = FN3.1.1 (P60); No = P54

P54: Begin generating a temporary list, called the P54 list. Retain this list throughout Step F4A-2. Generate a new

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P54 list each time P54 is executed, i.e., do not erase the P54 lists generated in previous executions of P54. Label this P54 list with: (1) the ID23 for this iteration of FN3 and (2) the value stored in P50.

P55: Put the two-part label entered on the P54 list just generated on a temporary list, called the P55 list.

P56: Add the ID4s on the P52 list to the P54 list just generated.

P57: Fill in data element (11) on the P24 list entry for this iteration of FN3 with the value stored in P50.

P58: Add '1' to the value stored in P50.

P59: Erase the P52 list.

P60: GO TO P66 (next FN3.1).

FN3.1.1 (from P53): FOR each of the two-part labels on the P55 list:

P61: Locate the P54 list corresponding to the label.

P62: Are the ID4s on the P54 list from P61 exactly the same as the ID4s on the P52 list? (Note: The ID4s do not need to be in the same order on both lists; it is only necessary that the same exact ID4s be on both lists.) Yes (i.e., the same persons are qualified to perform the task in this iteration of FN3.1 as were found to be qualified to do one or more other tasks on the P24 list for this iteration of FN3) = P63; No = P65 (next FN3.1.1)

P63: Fill in data element (11) on the P24 list entry for this iteration of FN3.1 with the value in the second part of the two-part label that is this iteration of FN3.1.1 (i.e., the value obtained in P50).

P64: GO TO P59.

P65: NEXT FN3.1.1; end of FN3.1.1, GO TO P54.

P66: (from P60) NEXT FN3.1; end of FN3.1, GO TO P67.

P67: Is there more than one entry (i.e., set of 11 data elements) on the P24 list from P49? Yes (i.e., it will be necessary to attempt to schedule multiple employee transport tasks at approximately the same time so that the employee does not have to be "transported" more than once) = P70; No = P68

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- P68: Put the ID23 for this iteration of FN3 on a temporary list called the P68 list. Retain this list throughout Function F4A. The P68 list is the list of labels of P24 list for P24 lists in which there is only one task on the P24 list. The one task on the P24 lists for which the label for the P24 list is on the P68 list must be a 'currently being scheduled' task and it will not be necessary to schedule tasks in groups when scheduling these tasks.
- P69: GO TO P72.
- P70: Examine the value in data element (2) for each entry (set of 11 data elements) on the P24 list from P49. Is the value for any of these entries a '2' (already scheduled)? Yes (i.e., it will be necessary to attempt to schedule all of the tasks on the P24 list next to an already scheduled task so that the employee does not have to be "transported" more than once) = P73 (next FN3); No (i.e., all of the tasks on the P24 list are not now currently scheduled (i.e., they are either currently being scheduled in this execution of Function F4A or are future scheduled tasks) so that it is not necessary to schedule the task next to a particular other task) = P71
- P71: Put the ID23 for this iteration of FN3 on a list called the P71 list. Retain this list throughout Function F4A. The P71 list is the list of labels for the P24 lists that have two or more tasks on them and none are 'already scheduled' tasks. The tasks must include at least one 'currently being scheduled' task. The tasks may, but do not necessarily, include 'future scheduled' tasks.
- P72: Remove the ID23 for this iteration of FN3 from the P25 list. When FN3 is completed, the P25 list will be the list of labels of P24 lists that have at least two tasks on them, one of which must be an 'already scheduled' task and one of which must be a 'currently being scheduled' task. There may also be 'future scheduled' tasks, but this is not necessary.
- P73: NEXT FN3; end of FN3, GO TO P74.
- P74: Are there any ID23s still on the P25 list? Yes (i.e., there are employee transport tasks that need to be scheduled next to an already scheduled task for the same employee) = P76; No = P75
- P75: Are there any ID23s on the P71 list? Yes (i.e., there are sets of employee transport tasks that need to be scheduled as a group, because they are for the same employee, but for which there is no already scheduled task next to which the tasks need to be scheduled) = P77; No (i.e., the remaining tasks to be scheduled are on the P68

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list; that is, they are employee transport tasks that currently need to be scheduled, but they do not need to be scheduled next to any other task because there are no already scheduled or future scheduled employee transport tasks for the same employee at this time) = P78

P76: GO TO P1 of Step F4A-3.

P77: GO TO P1 of Step F4A-4.

P78: GO TO P1 of Step F4A-5.

OUTPUTS AND GENERATION OF DATA SETS: None

#### STEP 4A-3

In this Step, the groups of 'employee transport' tasks formed in Step F4A-2 that contain 'already scheduled' are scheduled. ('Employee transport' tasks are those requiring bringing the employee participating in the task away from his work site, such as tasks that involve providing a medical examination for an employee.) Each of the groups of tasks scheduled in Step F4A-3 contains at least one 'already scheduled' task. That is, the group contains two or more task involving the same employee, at least one of which task has already been scheduled. Thus, for example, if an employee was already scheduled for a routine medical surveillance examination and it was found that the employee should also be scheduled to follow up on an occupational illness, the program would attempt to schedule the follow up on the illness at approximately the same time the always scheduled routine medical exam. This is done in order to reduce the number of visits that the employee must make for medical examinations away from his work. Similarly, the program "looks ahead" for future employee transport tasks involving the same employee and attempts to schedule these tasks at the same time. Thus, for example, if the employee needed to be scheduled for a follow up on an occupational illness, the program would look at the requirement suspense data on that employee (i.e., the DS4 data sets in which the employee is a requirement implementation unit) and determine if there are any employee transport tasks for that employee that should take place in the near future (such as a routine medical surveillance examination that is upcoming). If there are any such tasks within 90 days of the date that the program is scheduling the current task (i.e., in this example within 90 days of the date on which the follow up for an occupational illness is being scheduled), the program will attempt to schedule these tasks at the same time that the current task is scheduled. This procedure reduces the number of visits that the employee must make away from work to participate in the occupational health program. The program thus uses the requirements suspense data on date triggered requirements to enable the preparation of a scheduling plan that considers both already scheduled tasks and tasks that will need to be scheduled in the near future for the same employee.

In the terms used here, the tasks that were just recently recognized as needing to be scheduled are referred to a 'currently being scheduled' tasks. If, when scheduling the currently being scheduled tasks, it is found that there are tasks already scheduled for the same employee, these tasks are referred to as 'already scheduled' tasks. If, in checking the suspense data for the same employee, it is found that there are upcoming tasks that should be scheduled at the same time as the currently being scheduled tasks, these tasks are referred to as 'future scheduled' tasks. Step F4A-3 only schedules those groups of tasks containing at least one already scheduled task. If the program is scheduling employee transport tasks for an employee for which there are not any already scheduled tasks, this is done in



### STEP 4A-3

Step F4A-4 (if there is more than one currently being scheduled or future scheduled task for the employee) or in Step F4A-5 (if there is only one task needing to be scheduled for the employee). Of course, all Steps must involve groups of tasks containing at least one 'currently being scheduled' task.

Each group of tasks formed for the purposes of scheduling consists of all 'employee transport' tasks for a given employee and is defined by a list containing information about the tasks in the group. These lists were called the P24 list in Step F4A-2 during which the groups (lists) were formed. In Step F4A-3, the lists are referred to as R2 lists.

For each R2 list of tasks, Step F4A-3 attempts to schedule all of the tasks on the list at approximately the same time. The criteria for 'approximately the same time' is that a task be scheduled to start as soon after one of the already scheduled tasks for the same employee has been completed as possible and to end no later than the same day (within 9 hours) of one of the already scheduled tasks for the same employee. In order to accomplish this, the program first reviews the groups of tasks formed in Step F4A-2 to cull those groups that clearly cannot be scheduled at approximately the same time, e.g., those groups where the sum of the time slots required to schedule all of the tasks in the group is greater than 9 hours. Then the program forms groups of calendar time slots, i.e., periods of time that begin with an already scheduled task and end up to 9 hours later or when another already scheduled task for the same employee begins. (These groups of calendar time slots are entered on a list called the P177 list and are, therefore, referred to throughout Step F4A-3 as the P177 list entry groups.) These groups of calendar time slots may be considered as a first level potential scheduling map in that they identify the time periods that are considered to be at approximately the same time as the time periods in which already scheduled tasks are scheduled.

The next procedure is to identify the series of persons available to perform each of the tasks in the group of tasks for an employee and to identify for which calendar time slot these persons are available for being scheduled to perform the task. This adds a complication to the scheduling of multiple tasks in which the same employee will participate, because not all of the tasks in a group (i.e., not all of the tasks in which a given employee will participate) will necessarily be the type of tasks that can be performed by the same person. This is because the scheduling program limits the scheduling of tasks to those persons who are qualified to perform the task. For example, some of the tasks in the same group may be the type for which only a physician is qualified, while others may not require a physician. For this reason, a second level of potential scheduling maps is generated. Unlike the first level of potential scheduling maps, the same set of second level potential scheduling maps may not apply to all of the tasks in the group of tasks for the same employee. These second level potential scheduling maps consist of each of the 9 hour calendar time periods beginning with an already scheduled task (i.e., the first

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level scheduling maps) for each of the persons qualified to perform the task, if and only if the qualified person has time available for scheduling during that calendar time slot.

Having formed the scheduling maps, the program proceeds to schedule each of the tasks in the group onto one of the maps for the task. Of course, as each task in the group is scheduled for a particular time slot, that calendar time slot is eliminated from all maps (i.e., from all maps for all of the persons qualified to perform all of the tasks in the group) as being available for scheduling, because it is not acceptable to schedule the same employee to participate in more than one task at the exact same calendar time. Multiple attempts to schedule all of the tasks in a group may be necessary, for this reason. That is, because a change in the order in which tasks are scheduled may enable the scheduling of tasks that could not be scheduled in a previous scheduling attempt, multiple attempts at scheduling the tasks beginning at different points on the maps may need to be executed. Another reason why multiple attempts at scheduling may be necessary in order to find the optimum scheduling for all of the tasks in a group is that not all of the tasks in the group will have equal numbers of "chances" for being scheduled, e.g., some will have fewer numbers of qualified persons available to perform the task.

After each attempt to schedule all of the tasks in a group, i.e., after each combination of task scheduling options has been formed, a check is made to determine if this scheduling option meets the minimum criteria. The minimum criteria are defined as:

- 0 Having all of the 'already scheduled' tasks in the group scheduled.
- 0 Having at least one of the 'currently being scheduled' tasks in the group scheduled.
- 0 Having all of the calendar time slot groups (i.e., first level maps) begin with the scheduling of one of the tasks in the task group. This criteria is used in order that the employee who is participating in the task will be scheduled to begin participating in the tasks at the same time as he/she was previously scheduled to begin participating in the tasks, i.e., before the new 'currently being scheduled' tasks were added to the tasks in which the employee is to participate.

If the combination of task scheduling options meets the minimum criteria, a check is made to determine if this combination of task scheduling options is an 'ideal' scheduling option. The criteria for an ideal schedule are:

- 0 Having all tasks in the group of tasks for the same employee scheduled.

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- 0 Having the total calendar time for the scheduling of all tasks scheduled on a given calendar time slot map not exceed twice the length of the time required for scheduling these tasks. This criteria ensures that the breaks in the scheduling of the tasks, including the breaks between the scheduling of one task and the beginning of another task, are not excessive.
- 0 The combination of task scheduling options does not require rescheduling of any other tasks.
- 0 All tasks are scheduled in the preferred time use specified by the persons performing the task.

If the combination of task scheduling options meets the ideal scheduling selection criteria, the tasks are scheduled, according to this combination of task scheduling options. If not, further tries are made to attempt to schedule the tasks. Further attempts to schedule tasks will yield different combinations of task scheduling options because:

- 0 For each new scheduling attempt the program begins at a different point on the calendar scheduling maps, meaning that different time slots are "used up" and, therefore, the succeeding tasks have different time slots available (not "used up" in the scheduling of previous tasks).
- 0 With each successive try, the criteria for scheduling tasks becomes less rigid. For example, with the first try, the program excludes scheduling options that have any interruptions in the scheduling of the task, require rescheduling of any task, or are not in the correct preferred time use. With later tries, it is acceptable to reschedule tasks of certain kinds in order to schedule all of the employee transport tasks in the group being scheduled at approximately the same time. In still further scheduling attempts, even more types of tasks can be rescheduled. (The scheduling of a task in such a way that it will result in rescheduling of other tasks is allowed because it is considered critical to schedule all 'employee transport' tasks at approximately the same time in order to keep the burden on the work force of participation in the occupational health program activities as low as possible.)

With each attempt to schedule tasks, the current combination of task scheduling options is compared with the "best" combination of task scheduling options identified at that point. If the current combination of task scheduling options is better than the previous best combination found, the current combination becomes the new best combination of task scheduling options. Such successive tries at scheduling continue until an 'ideal' scheduling is option or until

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all scheduling options have been exhausted, i.e., until attempts have been made to schedule each task beginning at all points on the calendar scheduling maps. If the program reaches a point of exhausting all scheduling options, the program chooses the best combination of task scheduling options as the preferred scheduling option. If this scheduling option requires rescheduling a task, these tasks are removed from the current scheduling data and placed on the list of tasks that need to be rescheduled.

PREVIOUS STEP: Step F4A-3 follows P76 of Step F4A-2.

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

- R1: The list of task identifiers (ID23) that are the labels for the groups of employee transport tasks (i.e., the Step F4A-2 P24 lists) that are for the same employee and which include already scheduled tasks. This list is from the P25 list generated in Step F4A-2.
- R2: The lists of information about employee transport tasks that have been grouped together because they are tasks for the same employee. The lists include information about employee transport tasks that are currently being scheduled, already scheduled or future scheduled tasks for the same employee. The R2 lists are from the P24 lists generated in Step F4A-2. Only the P24 lists that have a label, i.e., task identifier (ID23) that is on the R1 list are needed as inputs to the Step F4A-3.
- R3: The list of task identifiers (ID23) that are labels for the "groups" of employee transport tasks (i.e., the Step F4A-2 P24 lists) that are for the same employee and which include only one task. The R3 list is from the P68 list generated in Step F4A-2.
- R4: The list of task identifiers (ID23) that are the labels for the groups of employee transport tasks (i.e., the Step F4A-2 P24 lists) that are for the same employee and which include multiple tasks on the list, none of which is an 'already scheduled' task. The R4 list is from the P71 list generated in Step F4A-2.
- R5: Current date

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- R6: A calendar with the number of days in a month for each of the months of a year. This includes the number of days in February for different years (for Leap Years and non-Leap Years). This calendar also includes the day of the week (Monday through Sunday) for each day of the year. This calendar is generated once at the initiation of OHMIS and is used thereafter with updates each year.
- R7: Next available requirement implementation identifier (ID9)
- R8: Next available task identifier (ID23)
- DS1: OHMIS requirement description data
- DS4: Requirement suspense data (i.e., date triggered requirements applicability data)
- DS5: Requirements implementation data
- DS23: Task descriptions data
- DS24: Specific task scheduling data
- DS25: Facility data by task type
- DS26: Regular weekly schedule availability data
- DS27: Monthly schedule data (availability and use)
- DS28: Contact and location data
- DL34: List of qualified employee identifiers (ID4) by task type (CT8) and by OHMIS service area (ID10)
- DL36: List of requirement implementation units (or sets of units) linked to their corresponding task identifier (ID23), OHMIS service area identifier (ID10) and whether the task is an 'employee transport' type of task
- DL37: List of the task identifier (ID23) by the name facility identifier (ID8) in which the task will take place and by its OHMIS service identifier (ID10)
- DL38: List of task identifiers (ID23) by requirement implementation identifier (ID9) and by OHMIS service area (ID10)
- DL39: List of task identifiers (ID23) for tasks that need to be rescheduled by OHMIS service area (ID10)

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- DL40: List of weekly schedule identifiers (ID28) by employee identifier (ID4) and by OHMIS service area (ID10)
- DL41: List of the monthly schedule identifiers (ID27) for an OHMIS service area (ID10) with the corresponding year and month covered by the monthly schedule data (DS27) identified by the ID27 and the employee identifier (ID4) of the employee performing the tasks scheduled on this DS27 data

PROCESSING (P = Processing substep: FN = For Next (program logic loop)):

- FN1: FOR each task identifier (ID23) on the R1 list:
- P1: Locate the R2 list that has the ID23 for this iteration of FN1 as its label.
- P2: Store a counter, called the P2 counter. The value in the P2 counter will be the total number of time slots required to complete all of the unscheduled tasks on the R2 list from P1 (i.e., those tasks that are not 'already scheduled'). Store the value of '0' in the P2 counter. Retain the value in the P2 counter throughout FN1.
- P3: Store a counter, called the P3 counter. The value in the P3 counter will be the number of time slots required to complete the currently being scheduled tasks on the R2 list from P1. Store the value of '0' in the P3 counter. Retain the value in the P3 counter throughout FN1.
- P4: Store a counter, called the P4 counter. The value in the P4 counter will be the number of time slots required to complete the already scheduled tasks on the R2 list from P1. Store the value of '0' in the P4 counter. Retain the value in the P4 counter throughout FN1.
- P5: Store a counter, called the P5 counter. The value in the P5 counter will be the number of time slots required to complete the future scheduled tasks, if any, on the R2 list from P1.
- Store the value of '0' in the P5 counter. Retain the value throughout FN1.
- FN1.1: FOR each entry (i.e., each of 11 data elements about a task) on the R2 list from P1:
- P6: Identify the requirement application identifier (ID5) in data element (3) for the entry on the R2 list from P1 for this iteration of FN1.1.

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P7: Put the ID5 from P6 on a temporary list called the P7 list. This is the list of all tasks on the R2 list from P1. Retain the P7 list throughout FN1.

P8: NEXT FN1.1; end of FN1.1, GO TO FN1.2 (P9).

FN1.2: FOR each ID5 on the P7 list:

P9: Locate the entry (i.e., set of 11 data elements) on the R2 list from P1 for this ID5.

P10: Determine the value in data element (2) (code for type of task being scheduled) for the R2 list entry located in P9. Store this value throughout FN1.2.

P11: Determine the value in data element (9) (i.e., the number of time slots required to complete this task) for the R2 list entry located in P9.

P12: Is the value from P11 greater than '32' (i.e., greater than 8 hours)? Yes (i.e., this task takes more than a day to conduct and, therefore, it should not be scheduled next to another task (or, have other tasks scheduled next to it, if this is an 'already scheduled' task)) = P13; No = P19

P13: Is the value stored in P10 a '1', '2' or '3'? 1 = P17; 2 = P14; 3 = P14

P14: Remove the entire data entry located in P9 (all 11 data elements) from the R2 list located in P1.

P15: Remove the ID5 for this iteration of FN1.2 from the P7 list.

P16: GO TO P32 (next FN1.2).

P17: Put the ID5 for this iteration of FN1.2 on a temporary list called the P17 list.

P18: GO TO P15.

P19: Is the value stored in P10 a '1', '2' or '3'? 1 = P20; 2 = P25; 3 = P29

P20: Identify the task identifier (ID23) in data element (1) on the R2 list entry located in P9.

P21: Add the ID23 from P20 to a temporary list called the P21 list. Retain this list throughout FN1.

P22: Add the value from P11 to the P3 counter.

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- P23: Add the value from P11 to the P2 counter.
- P24: GO TO P32 (next FN1.2).
- P25: Identify the ID23 in data element (1) on the R2 list located in P9.
- P26: Add the ID23 from P25 to a temporary list called the P26 list. Retain this list throughout FN1.
- P27: Add the value from P11 to the P4 counter.
- P28: GO TO P32 (next FN1.2).
- P29: Add the ID5 for this iteration of FN1.2 to a temporary list called the P29 list. Retain this list throughout FN1.
- P30: Add the value from P11 to the P5 counter.
- P31: GO TO P23.
- P32: NEXT FN1.2; end of FN1.2, GO TO P33.
- P33: Are there any ID5s on the P17 list? Yes (i.e., there are 'currently being scheduled' tasks that require longer than 8 hours to complete on the R2 list from P1) = FN1.3 (P34); No = P48

FN1.3 FOR each ID5 on the P17 list:

- P34: Locate the entry (i.e., set of 11 data elements) on the R2 list from P1 for this ID5.
- P35: Identify the task identifier (ID23) in data element (1) on the R2 list entry located in P34.
- P36: Generate a new R2 list (i.e., a new Step F4A-2 P24 list). Put the ID23 from P35 as the label on the new R2 list. Copy the R2 list entry from this iteration of FN1.3 (as located in P34) onto the new R2 list as the first (and only) entry (set of 11 data elements) on the new R2 list. (Generate a new R2 list each time P36 is executed, i.e., do not erase previously generated R2 lists. Treat the R2 lists as though they were generated in P24 of Step F4A-2.)
- P37: Remove the entire data entry (all 11 data elements) for the R2 list data entry located in P34 from the R2 list located in P1.
- P38: Add the ID23 for this iteration of FN1.3 to the R3 list (i.e., the Step F4A-2 P68 list of labels of P24 lists that contain only one task).



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P39: NEXT FN1.3; end of FN1.3, GO TO P40.

P40: Are there any ID23s on the P21 list (i.e., were any ID3s put on the P21 list during FN1.2)? Yes = P45; No (i.e., all of the 'currently being scheduled' tasks on the R2 list from P1 required more than 8 hours to complete the task) = P41

P41: Erase the R2 list located in P1.

P42: Erase the ID23 for this iteration of FN1 from the R1 list (i.e., from the Step F4A-2 P25 list of labels of P24 lists containing multiple tasks at least one of which is an 'already scheduled' task).

P43: Erase all lists counters generated in this iteration of FN1.

P44: GO TO P1046 (next FN1).

P45: Is the ID23 for this iteration of FN1 on the P21 list? Yes = P48; No (i.e., the R2 list from P1 is now mislabeled as it is labeled with a 'currently being scheduled' task that is no longer included on the R2 list) = P46

P46: Change the task identifier (ID23) that is the label on the R2 list from P1 (i.e., for this iteration of FN1) to be one of the ID23s on the P21 list.

P47: Locate the ID23 for this iteration of FN1 on the R1 list (i.e., on the Step F4A-2 P25 list) and replace that ID23 with the ID23 used in P46 to relabel the R2 list from P1. (Note: It is important that this new label (ID23) on the R1 list be put in the same spot on the list as the ID23 for this iteration of FN1, not at the end of the R1 list. If this is not done, the FN1.1 and FN1.3 iterations will be repeated, because the program will arrive at the ID23 from the relabeled R2 list a second time.) Also, replace the ID23 for this iteration of FN1 with the ID23 used in P46 to relabel the R2 list from P1. That is, change the ID23 for this iteration of FN1 so that the program will consider this iteration of FN1 to be processing the group of tasks with the new label identified in P46. This is rational, because the R2 list being processed in this iteration of FN1 has not changed, only the label for this R2 list has changed.

P48: Are there still any ID23s on the P26 (already scheduled) list? Yes = FN1.4 (P52); No (i.e., all of the 'already scheduled' tasks on the R2 list from P1 required more than 8 hours to complete; because the R2 list from P1 does not contain any 'already scheduled' tasks, this R2 list should not be processed in Step F4A-3) = P49

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- P49: Is there still more than one ID5 on the P7 list? Yes = P50; No = P51
- P50: Identify the task identifier (ID23) that is the label on the R2 list from P1, i.e., the task identifier (ID23) for this iteration of FN1. Put this ID23 on the R4 list (i.e., the Step F4A-2 P71 list of labels of P24 (R2) lists containing groups of tasks, none of which are 'already scheduled' tasks). GO TO P42.
- P51: Identify the task identifier (ID23) that is the label on the R2 list from P1, i.e., the ID23 for this iteration of FN1. Put this ID23 on the R3 list (i.e., the Step F4A-2 P68 list of labels of P24 (R2) lists containing only one task). GO TO P42.
- FN1.4: FOR each ID23 on the P21 ('currently being scheduled') list:
- P52: Locate the entry on the R2 list from P1 with the ID23 for this iteration of FN1.4 in data element (1). Locate the ID5 in data element (3) on this entry, also.
- P53: Does data element (8) of the R2 list entry located in P52 have a value (i.e., a facility identifier (ID8)) in it? Yes = P56; No = P54
- P54: Put the ID5 from P52 on a temporary list called the P54 list.
- P55: GO TO P70 (next FN1.4).
- P56: Identify the ID8 in data element (8) of the R2 list entry from P52.
- P57: Is there any P58 record? Yes = P60; No (i.e., this is the first task on the P21 list for which the facility in which the task will be conducted is known) = P58
- P58: Store the ID8 identified in P56 throughout FN1.
- P59: GO TO P70 (next FN1.4).
- P60: Is the ID8 from P56 the same as the ID8 stored in P58? Yes = P54; No = P61
- P61: Are there any P62 lists? Yes = FN1.4.1 (P65); No = P62
- P62: Start a list, called the P62 list. (Generate a new P62 list each time P62 is executed, i.e., do not erase P62 lists generated in previous iterations of FN1.4.) Label this P62 list with the ID8 from P56. Put the ID5 from P52 on this P62 list.

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P63: Put the ID8 from P56 on a temporary list called the P63 list. The P63 list is the list of labels of P62 lists.

P64: GO TO P70 (NEXT FN1.4).

FN1.4.1: FOR each ID8 on the P63 list:

P65: Is the ID8 from P56 the same as the ID8 for this iteration of FN1.4.1? Yes = P66; No = P69 (next FN1.4.1)

P66: Locate the P62 list with the ID8 in this iteration of FN1.4.1 as its label.

P67: Add the ID5 from P52 onto the P62 list located in P66.

P68: GO TO P70 (next FN1.4).

P69: NEXT FN1.4.1; end of FN1.4.1, GO TO P62.

P70: NEXT FN1.4; end of FN1.4, GO TO FN1.5 (P71).

FN1.5: FOR each ID3 on the P26 (already scheduled) list:

P71: Locate the entry on the R2 list from P1 with the ID23 for this iteration of FN1.5 in data element (1). Locate the ID5 in data element (3) on this entry.

P72: Does data element (3) of the R2 list entry located in P71 have a value (i.e., an ID8)? Yes = P75; No = P73

P73: Put the ID5 from P71 onto the P54 list.

P74: GO TO P88 (next FN1.5).

P75: Identify the ID8 in data element (8) of the R2 list entry from P71.

P76: Is the ID8 from P75 the same as the ID8 stored in P58? Yes = P73; No = P77

P77: Are there any ID8s on the P63 list? Yes = FN1.5.1 (P78); No = P83

FN1.5.1: FOR each ID8 on the P63 list:

P78: Is the ID8 from P75 the same as the ID8 for this iteration of FN1.5.1? Yes = P79; No = P82 (next FN1.5.1)

P79: Locate the P62 list with the ID8 for this iteration of FN1.5.1 as its label.

P80: Add the ID5 from P71 onto the P62 list located in P79.

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P81: GO TO P88 (next FN1.5).

P82: NEXT FN1.5.1; end of 1.5.1, GO TO P82.

P83: Identify the value in data element (9) (number of time slots required to complete the task) of the R2 list entry from P71.

P84: Subtract the value identified in P83 from the P4 counter.

P85: Remove the entire entry (all 11 data elements) located in P71 from the R2 list from P1.

P86: Remove the ID23 for this iteration of FN1.5 from the P26 (already scheduled) list.

P87: Remove the ID5 from P71 from the P7 (all tasks) list.

P88: NEXT FN1.5; end of FN1.5, GO TO FN1.6 (P89).

FN1.6: FOR each ID5 on the P29 (future scheduled) list:

P89: Locate the entry on the R2 list from P1 with the ID 5 for this iteration of FN1.6 in data element (3).

P90: Does data element (8) of the R2 list entry located in P89 have a value (i.e., an ID8)? Yes = P93; No = P91

P91: Put the ID5 for this iteration of FN1.6 onto the P54 list.

P92: GO TO P106 (next FN1.6).

P93: Identify the ID8 in data element (8) of the R2 list entry from P89.

P94: Is the ID8 from P93 the same as the ID8 stored in P58?  
Yes = P91; P = P95

P95: Are there any ID8s on the P63 list? Yes = FN1.6.1 (P96);  
No = P101

FN1.6.1: FOR each ID8 on the P63 list:

P96: Is the ID8 from P93 the same as the ID8 for this iteration of FN1.6.1? Yes = P97; No = P100 (next FN1.6.1)

P97: Locate the P62 list with the ID8 for this iteration of FN1.6.1 as its label.

P98: Add the ID5 for this iteration of FN1.6 onto the P62 list located in P97.

P99: GO TO P106 (next FN1.6).

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P100: NEXT FN1.6.1; end of FN1.6.1, GO TO P101.

P101: Identify the value in data element (9) (time slots required to complete the task) of the R2 list entry from P89.

P102: Subtract the value identified in P101 from the P5 counter.

P103: Remove the entire entry (all 11 data elements) located in P89 from the R2 list located in P1.

P104: Remove the ID5 for this iteration of FN1.6 from the P29 (future scheduled) list.

P105: Remove the ID5 for this iteration of FN1.6 from the P7 (all tasks) list.

P106: NEXT FN1.6; end of FN1.6, GO TO P107.

P107: Are there any ID8s on the P63 list? Yes (i.e., some of the tasks on the R2 list from P1 should not be scheduled together because they are to be conducted in different facilities) = FN1.7 (P108); No = P163

FN1.7: FOR each of the ID8s on the P63 list:

P108: Locate the P62 list with the ID8 for this iteration of FN1.1 as its label.

FN1.7.1: FOR each ID5 on the P62 list located in P108:

P109: Locate the entry on the R2 list from P1 with the ID5 for this iteration of FN1.7.1 in data element (3). Is the code in data element (2) of this R2 list entry a '1'? Yes = P110; No = P112 (next FN1.7.1)

P110: Identify and store the task identifier (ID23) in data element (1) of the R2 list entry located in P109.

P111: GO TO P113.

P112: NEXT FN1.7.1. (Note: End of FN1.7.1 will never be reached.)

P113: Start generating a new R2 list (i.e., a new Step F4A-2 P24 list). Put the ID23 from P110 as the label on the new R2 list. Generate a new R2 list each time P113 is executed, i.e., do not erase the previous R2 lists. Treat the R2 lists generated in P113 as though they were generated in P24 of Step F4A-2.

FN1.7.2: FOR each ID5 on the P62 list located in P108:

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- P114: Locate the entry on the R2 list from P1 with the ID5 for this iteration of FN1.7.2 in data element (3).
- P115: Copy the R2 list entry located in P114 onto the new R2 list generated in P113, i.e., the R2 list generated in this iteration of FN1.7.
- P116: Identify the value in data element (9) (time slots required to complete the task) on the R2 list entry from P114.
- P117: Is the code in data element (2) of the R2 list entry from P114 a '1', '2' or '3'? 1 - P128; 2 = P118; 3 = P124
- P118: Identify the task identifier (ID23) in data element (1) of the R2 list entry located in P114.
- P119: Remove the ID23 identified in P118 from the P26 (already scheduled) list.
- P120: Subtract the value identified in P116 from the P4 counter.
- P121: Remove the entire R2 list entry (all 11 data elements) located in P114 from the R2 list located in P1.
- P122: Remove the ID5 for this iteration of FN1.7.2 from the P7 list.
- P123: GO TO P132 (next FN1.7.2).
- P124: Remove the ID5 for this iteration of FN1.7.2 from the P29 (future scheduled) list.
- P125: Subtract the value identified in P116 from the P5 counter.
- P126: Subtract the value identified in P116 from the P2 counter.
- P127: GO TO P121.
- P128: Identify the task identifier (ID23) in data element (1) of the R2 list entry located in P114.
- P129: Remove the ID23 identified in P128 from the P21 (currently being scheduled) list.
- P130: Subtract the value identified in P116 from the P3 counter.
- P131: GO TO P126.
- P132: NEXT FN1.7.2; end of FN1.7.2, GO TO P133.

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P133: Store a counter with the value '0'. This counter, called the P133 counter, will be a count of the number of entries on the newly generated R2 list from P113.

FN1.7.3: FOR each entry on the newly generated R2 list from P113:

P134: Add '1' to the P133 counter.

P135: Is the code in data element (2) of the P113 R2 list entry for this iteration of FN1.7.3 a '2' (already scheduled task)? Yes = P136; No = P138 (next FN1.7.3)

P136: Generate a temporary flag, called the P136 flag, indicating that the newly generated R2 list (from P113) does include already scheduled tasks. (Note: If this flag has already been generated in previous iterations of FN1.7.3, proceed to P137.)

P137: NEXT FN1.7.3; end of FN1.7.3, GO TO P138.

P138: Identify the label (task identifier (ID23)) on the newly generated R2 list from P113.

P139: Is the P133 counter equal to a '1'? Yes = P140; No = P144

P140: Add the ID23 from P138 to the R3 list (i.e., the Step F4A-2 P68 list of P24 (R2) list labels for P24 (R2) lists that only contained '1' task on them).

P141: Is the ID23 from P138 the same as the ID23 for this iteration of FN1 (i.e., the label for the R2 list from P1)? Yes = P142; No = P149 (next FN1.7)

P142: Remove the ID23 from the R1 list (i.e., from the Step F4A-2 P25 list of labels of P24 (R2) lists for P24 (R2) lists containing multiple tasks at least one of which is an 'already scheduled' task).

P143: GO TO P149 (next FN1.7).

P144: Is there a P136 flag? Yes = P147; No = P145

P145: Add the ID23 from P138 to the R4 list (i.e., the Step F4A-2 P71 list of P24 (R2) list labels for P24 (R2) lists with multiple tasks none of which is an 'already scheduled' task).

P146: GO TO P141.

P147: Is the ID23 from P138 the same as the ID23 for this iteration of FN1? Yes = P149 (next FN1.7); No = P147

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- P148: Add the ID23 from P138 to the end of the R1 list (i.e., the Step F4A-2 P25 list of P24 (R2) list labels for P24 (R2) lists that contain multiple entries at least one of which is an 'already scheduled' task).
- P149: NEXT FN1.7; end of FN1.7, GO TO P150.
- P150: Erase the P62 lists generated in this iteration of FN1.
- P151: Erase the P63 list generated in this iteration of FN1.
- P152: Are there still any entries on the P21 list? Yes = P153;  
No = P41
- P153: Is the ID23 for this iteration of FN1 on the P21 list?  
Yes = P156; No = P154
- P154: Change the task identifier (ID23) that is the label on the R2 list from P1 (i.e., for this iteration of FN1) to be one of the ID23s on the P21 list.
- P155: Locate the ID23 for this iteration of FN1 on the R1 list (i.e., on the Step F4A-2 P25 list) and replace that ID23 with the ID23 used in P153 to relabel the R2 list from P1. Also replace the ID23 for this iteration of FN1 with the ID23 used in P153 to relabel the R2 list from P1. (See note in P47 for an explanation of the rationale for P155.)
- P156: Are there still any ID23s on the P26 (already scheduled) list? Yes = P163; No = P157
- P157: Identify the task identifier (ID23) that is the label on the R2 list from P1, i.e., the ID23 for this iteration of FN1.
- P158: Is there more than one ID5 on the P7 list? Yes = P159; No = P161
- P159: Put the ID23 identified in P157 on the R4 list (i.e., the Step F4A-2 P71 list of P24 (R2) list labels).
- P160: GO TO P42.
- P161: Put the ID23 identified in P157 on the R3 list (i.e., the Step F4A-2 P68 list of P24 (R2) list labels).
- P162: GO TO P42.
- P163: Is the value in the P3 counter (time slots required to complete all of the 'currently being scheduled' tasks on the R2 list from P1) greater than '32'? Yes (i.e., although no individual task requires more than 8 hours,



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the combination of all of the currently being scheduled tasks now on the R2 list from P1 requires more than 8 hours and, therefore, it is not possible to schedule all of these tasks at one time) = P164; No = P172

P164: Are there any ID5s on the P29 (future scheduled tasks) list? Yes = FN1.8 (P165); No = P175

FN1.8 FOR each requirement application identifier (ID5) on the P29 list:

P165: Locate the entry on the R2 list from P1 with the ID5 for this iteration of FN1.8 in data element (3).

P166: Erase the entire R2 list entry (all 11 data elements) located in P165 from the R2 list located in P1.

P167: NEXT FN1.8; end of FN1.8, GO TO P168.

P168: Erase the P29 list.

P169: Set the P5 counter to '0'.

P170: Set the P2 (total required time slots for unscheduled tasks) counter to be equal to the P3 counter (required time slots for 'currently being scheduled').

P171: GO TO P175.

P172: Is the value in the P5 counter (time slots required for future scheduled tasks) greater than '32'? Yes = FN1.8 (P165); No = P173

P173: Calculate the sum of the value in the P5 counter (future scheduled tasks) and the value in the P3 counter (currently being scheduled tasks).

P174: Is the sum derived in P173 greater than '32'? Yes = FN1.8 (P165); No = P175

P175: Expand each entry on the P26 (already scheduled) list of ID23s. Next to each ID23 on the P26 list leave a blank field for a value (1-99) indicating into which group the ID23 belongs. The ID23s will be grouped by groups of 'already scheduled' ID23s that are scheduled at approximately the same time. The value in the field next to the ID23 will be an arbitrary number indicating to which of these groups the ID23 belongs.

P176: Store the value '1'. This will be the counter used to arbitrarily group already scheduled tasks that have been scheduled at approximately the same time.

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P177: Start a list, called the P177 list. Each entry on the P177 list will have 4 data elements:

- (1) The value in the P176 counter
- (2) The time slot information for the time that the first already scheduled task in the group of already scheduled tasks labeled with the value in data element (1) is scheduled to start
- (3) The time slot information for the time slot that is '36' (9 hours) time slots later than the start time slot (i.e., the time slot given in data element (2)), or, the time slot that is just before the start time slot of the first task in the next group of tasks identified by data element (1), whichever smaller.
- (4) The number of time slots between the time slot in data element (2) and the time slot in data element (3)

The P177 list will be in order of groups of tasks having the earliest to latest start times (data element (2)). Time slot information for the P177 list consists of 6 parts:

- (1) monthly schedule identifier (ID27);
- (2) the year shown on the DS27 data for the ID27 in part (1);
- (3) the month shown on the DS27 data for the ID27 from part (1);
- (4) a date (1-31);
- (5) a time slot number (number from 1 to 96 for the quarter of an hour period during a day); and,
- (6) day of the week shown on the DS27 data for the date in part (4) and identified from R6.

FN1.9: FOR each ID23 on the P26 list:

P178: Locate the entry on the R2 list from P1 with this ID23 in data element (1).

P179: Identify the 5 parts of the time slot information for the start time for the task in this iteration of FN1.9. Parts 1, 4 and 5 of the time slot information for the start time are in data element (10a) on the R2 list

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entry located in P178. Part 2 (year) and part 3 (month) are obtained from the DS27 data corresponding to the ID27 in part 1.

- P180: Is the time slot identified in P179 for a time slot that is equal to or earlier than the R5 date (i.e., the current date)? (Note: To determine this, examine parts 2 (year), 3 (month) and 4 (date) of the time slot information from P179.) Yes (i.e., the 'currently being scheduled' tasks and the R2 list from P1 should not be scheduled next to the task in this iteration of FN1.9 because this task is before the current date) = P181; No = P187
- P181: Locate the value in data element (9) (time slots required to complete the task) in the R2 list entry from P178.
- P182: Subtract the value identified in P181 from the P4 counter.
- P183: Erase the ID23 for this iteration of FN1.9 from the P26 list.
- P184: Locate the requirement application identifier (ID5) in data element (3) of the R2 list entry from P178.
- P185: Erase the ID5 identified in P184 from the P7 list.
- P186: Erase the entire R2 list entry (all 11 data elements) located in P178 from the R2 list located in P1.
- P187: Are there still any entries (ID23s) on the P26 list? Yes = P188; No = P157
- P188: Is there a P195 flag? Yes = P197; No = P189
- P189: Identify the 5 part time slot information for the end time of the task in this iteration of FN1.9. This is from data element (10b) of the R2 list entry located in P178.

FN1.9.1: FOR each ID23 on the P21 (currently being scheduled) list:

- P190: Locate the entry on the R2 list from P1 that has the ID23 for this iteration of FN1.9.1 in data element (1).
- P191: Examine data element (4) (due date) of the R2 list entry from P190. Does it contain a date (i.e., is there a due date for this task)? Yes = P192; No (i.e., there is at least one task that could be scheduled next to the task in this iteration of FN1.9 without overrunning a due date) = P197

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- P192: Identify the due date in data element (4) of the R2 list entry from P190.
- P193: Is the date on which the already schedule task in this iteration of FN1.9 is scheduled to end (as determined in P189) equal to or later than the due date from P192? Yes (i.e., the task in this iteration of FN1.9.1 could not be scheduled next to the already scheduled task in this iteration of 1.9 because it would mean scheduling the FN1.9.1 task after its due date; if no unscheduled tasks are found next to which the task in this iteration of FN1.9 can be scheduled, i.e., if the end of FN1.9.1 is reached without an answer of 'No' in either P189 or P191, then the FN1.9 task will be eliminated as a task next to which tasks can be scheduled in this iteration of FN1) = P194 (next FN1.9.1); No (i.e., there is at least one task that could be scheduled next to the task in this iteration of FN1.9 without overrunning a due date) = P197
- P194: NEXT FN1.9.1; end of FN1.9.1, GO TO P195.
- P195: Generate a temporary flag, called the P195 flag, indicating that FN1.9.1 has been executed.
- P196: GO TO P181.
- P197: Start a temporary list, called the P197 list. Each entry on the P197 list will have three data elements:
- (1) A task identifier (ID23);
  - (2) A start time slot information set (6 part time slot information) for the task in data element (1); and
  - (3) An end time slot information set for this task
- The order of the P197 list is important. The P197 list is in order of tasks with the earliest to latest start times (data element (2)).
- P198: Generate the 3 parts of an entry to the P197 list. Data element (1) is the ID23 for this iteration of FN1.9. Data element (2) is the start time slot information from P179. Data element (3) is the end time slot information from P189.
- P199: Are there any entries (sets of 3 data elements) on the P197 list? Yes = FN1.9.2 (P202); No = P200
- P200: Enter the P197 list entry generated in P198 into the P197 list as the first entry to the list.

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P201: GO TO P209 (next FN1.9).

FN1.9.2: FOR each entry on the P197 list:

P202: Locate the P197 entry for this iteration of FN1.9.2.

P203: Identify the start time slot in data element (2) of the P197 list entry identified in P202.

P204: Is the start time identified in P203 later than the start time identified in P179? Yes = P205; No = P207 (next FN1.9.2)

P205: Enter the P197 list entry generated in P198 onto the P197 list in the spot immediately above the P197 list entry for this iteration of FN1.9.2.

P206: GO TO P209 (next FN1.9).

P207: NEXT FN1.9.2; end of FN1.9.2, GO TO P208.

P208: Enter the P197 list entry generated in P198 onto the P197 list as the last entry on the list.

P209: NEXT FN1.9; end of FN1.9, GO TO FN1.10 (P210).

FN1.10: FOR each entry on the P197 list:

P210: Locate this entry (set of 3 data elements) on the P197 list.

P211: Identify the task identifier (ID23) that is data element (1) for the P197 list entry located in P210.

P212: Locate the start time slot in data element (2) for the P197 list entry from P210.

P213: Locate the end time slot in data element (3) for the P197 list entry from P210.

P214: Is the P197 entry located in P210 the first entry on the P197 list? Yes = P215; No = P221

P215: Begin to generate an entry to the P177 list. Data element (1) of the P177 list entry should be the value in P176. Data element (2) of the P177 list entry should be the start time in data element (2) of the P197 list entry in this iteration of FN1.10, i.e., the start time located in P212.

P216: Determine the value for data element (3) (end time slot) of the P177 list entry started in P215. This is the value

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that is '36' (9 hours) later than the time slot identified in P212, i.e., 9 hours after the start time slot in data element (2) of the P177 list entry started in P215. This is referred to as the P216 time slot.

Note: The following are the processing substeps (PS) for deriving the P216 time slot information:

- PS1: Identify part (5) (time slot number) of the time slot information from P212.
- PS2: Add '36' (9 hours) to the value from PS1.
- PS3: Is the value derived in PS2 greater than '96'? Yes = PS6; No = PS4
- PS4: Parts (1)-(4) and part (6) of the P216 time slot information are the same as the P212 time slot information. Part (5) is the value in PS2.
- PS5: GO TO P217.
- PS6: Subtract '96' from the PS2 value. This is part (5) of the P216 time slot.
- PS7: Identify part (4) (day) of the time slot information from P212.
- PS8: Add '1' to the value in PS7.
- PS9: Identify part (3) (month) and part (2) (year) of the time slot information from P212.
- PS10: Use R6 to identify the last day (28 through 31) for the month from PS9 (and, if necessary, the year from PS9).
- PS11: Is the value from PS8 greater than the value from PS10 (last day of the month)? Yes = PS14; No = PS12
- PS12: Parts (1)-(3) of the P216 time slot information are the same as parts (1)-(3) of the P212 time slot information. Part (4) is the value in PS8.
- PS13: GO TO PS22.
- PS14: Part (4) (day) of the P216 time slot is '1'.
- PS15: Part (1) (ID27) of the P216 time slot should be left blank.

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- PS16: Add '1' to the value in part (3) (month) of the P212 time slot information (as identified in PS9).
- PS17: Is the PS16 value equal to '13'? Yes = PS20; No = PS18
- PS18: Part (3) (month) of the P216 time slot information is the value in PS16. Part (2) (year) of the P216 time slot information is the value in part (2) of the P212 time slot information (as determined in PS9).
- PS19: GO TO PS22.
- PS20: Part (3) (month) of the P216 time slot information is '1'.
- PS21: Add '1' to the value in part (2) of the P212 time slot information (as determined in PS9). This is the value for part (2) (year) of the P216 time slot information.
- PS22: Identify part (6) (day of the week) of the time slot information from P212.
- PS23: Is the PS22 value equal to '7'? Yes = PS24; No = PS26
- PS24: Part (6) (day of the week) of the P216 time slot information is '1'.
- PS25: GO TO P217.
- PS26: Add '1' to the PS22 value. This is the value for part (6) of the P216 time slot information.
- PS27: GO TO P217.
- P217: Add the P216 time slot derived above to data element (3) of the P177 list entry started in P215.
- P218: Fill data element (4) of the P177 list entry started in P215 with the value '36'.
- P219: Add the value stored in the P176 counter to the P26 list entry for the ID23 identified in P211.
- P220: GO TO P232 (next FN1.10).
- P221: Is the end time slot identified in P213 later than the end time slot information in data element (3) of the last P177 entry, i.e., is this task scheduled to end at a

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time that is more than 9 hours after the previous task was scheduled to begin? Yes (i.e., this task will be grouped with the next group of tasks) = P222; No (i.e., this task will be grouped with the previous task because it is scheduled at approximately the same time) = P219

P222: Add '1' to the P176 counter.

P223: Is the start time slot identified in P212 later than the time slot information in data element (3) of the last P177 list entry, i.e., is this task scheduled to start at a time that is more than 9 hours after the previous task is scheduled to start? Yes = P215; No (i.e., in order not to overlap with the next group of tasks, the length of time for the last group of tasks must be shortened to end immediately before this group begins) = P224

P224: Locate the last P177 list entry. (Note: This will be the entry with the value in data element (1) that is '1' less than the current P176 counter.)

P225: Erase the values in data elements (3) and (4) in the P177 list entry located in P224.

P226: Subtract '1' time slot from time slot information located in P212. This is referred to as the P226 time slot information.

Note: The following are the processing substeps (PS) for deriving the P226 time slot information:

PS1: Identify the value in part (5) (time slot number) of the time slot information from P212.

PS2: Subtract '1' from the value located in PS1.

PS3: Is the value derived in PS2 equal to or greater than '1'? Yes = PS4; No = PS6

PS4: Parts (1)-(4) and part (6) of the P226 time slot information are the same as parts 1-4 of the P212 time slot information. Part (5) of the P226 time slot information is the value calculated in PS2.

PS5: GO TO P227.

PS6: Part (5) of the P226 time slot information is equal to '96'.

PS7: Identify part (4) (date) of the time slot information from P212.



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- PS8: Subtract '1' from the value located in PS7.
- PS9: Is the value derived in PS8 equal to or greater than '1'? Yes = PS10; No = PS12
- PS10: Parts (1)-(3) of the P226 time slot information is the same as parts (1)-(3) of the P212 time slot information. Part (4) of the P226 time slot information is the value calculated in PS8.
- PS11: GO TO PS20.
- PS12: Part (1) (ID27) of the P226 time slot information should be left blank.
- PS13: Identify part (3) (month) of the time slot information in P212.
- PS14: Subtract '1' from the value in PS13.
- PS15: Is the value derived in PS14 equal to or greater than the '1'? Yes = PS16; No = PS19
- PS16: Part (2) (year) of the P226 time slot information is the same as part (2) of the P212 time slot information. Part (3) (month) of the P226 time slot information is the value in PS14.
- PS17: Use R6 to identify the value for the last day of the month for the month with the value in PS14 (and, if necessary, the year with the value in part (2) of the P212 time slot information). This is the value for part (4) (day) of the P226 time slot information.
- PS18: GO TO PS20.
- PS19: Subtract '1' from the value in part (2) (year) in the P212 time slot information. This is the value of part (2) of the P226 time slot information. Part (3) (month) of the P226 time slot information is '12'. Part (4) (day) is '31'.
- PS20: Identify the value in part (6) (day of the week) of the time slot information from P212.
- PS21: Is the value in PS20 equal to '1'? Yes = PS22; No = PS24
- PS22: Part (6) (day of the week) of the P226 time slot information is '7'.

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PS23: GO TO P227.

PS24: Subtract '1' from the PS20 value. This is the value for part (6) of the P226 time slot information.

PS25: GO TO P227.

P227: Place the P226 time slot derived above into data element (3) of the P177 list entry located in P224 (i.e., the last P177 list entry).

P228: Locate the time slot information in data element (2) of the P177 list entry located in P224.

P229: Determine the difference (number of time slots) between the P226 time slot and the P228 time slot, i.e., between data element (2) and data element (3) of the P177 listing entry located in P224. This is referred to as the P229 value.

Note: To derive the P229 value, which is known to be less than '37' time slots, follow these processing substeps (PS):

PS1: Identify the value in part (5) (time slot number) of the P226 time slot.

PS2: Identify the value in part (5) of the P228 time slot.

PS3: Is the PS2 value smaller than the PS1 value? Yes = PS5; No = PS4

PS4: Add '96' to the PS1 values.

PS5: Subtract the PS2 value from the PS1 value.

PS6: Add '1' to the PS5 value (because, we are counting the inclusive difference between the two values). This is the P229 value.

PS7: GO TO P230.

P230: Place the P229 value derived above in data element (4) of the P177 list entry located in P224.

P231: GO TO P215.

P232: NEXT FN1.10; end of FN1.10, GO TO P233.

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P233: Locate the last P177 list entry. Identify the value in data element (1) (P176 counter in this entry). This is the value for the number of groups of tasks in this iteration of FN1 as defined by P177 entries. Store this value.

FN1.11: FOR each requirement application identifier (ID5) on the P7 (all tasks) list:

P234: Generate a list, called the P234 list. This will be a list of all P177 list entry groups to which a given task belongs. (Generate a new such list each time P234 is executed, i.e., one for each task; do not erase previous P234 lists made in this iteration of FN1.) Each P234 list will be labeled with a two-part label consisting of an ID5 and the code (1-3) indicating whether the task is a currently being scheduled, already scheduled or future scheduled task. Each P234 list entry will consist of a value (1-99) indicating one of the P177 list entry groups to which the task belongs.

P235: Locate the entry on the R2 list from P1 with the ID5 for this iteration of FN1.11 in data element (3).

P236: Identify the value in data element (2) (code) for the R2 list entry located in P235.

P237: Generate a label for the P234 list generated in this iteration of FN1.11. This label consists of the ID5 for this iteration of FN1.11 and the code located in P236. Place this label on the P234 list.

P238: NEXT FN1.11; end of FN1.11, GO TO FN1.12 (P239).

FN1.12: FOR 'X' iterations (where 'X' is defined as the value in P233); i.e., for each P177 list entry:

P239: Start a list called the P239 list. This is a list of the tasks included in each task group where a task group is defined as a P177 list entry. Generate a new such list each time P239 is executed, i.e., one for each group. Label the P239 list generated in this iteration of FN1.12 with the value for 'X' in this iteration of FN1.12. Each P239 list entry will have 2 data elements:

- (1) An ID5 identifying the task; and
- (2) A code (1-3) indicating whether the task is a currently being scheduled, already scheduled or future scheduled task.

P240: NEXT FN1.12; end of FN1.12, GO TO FN1.13 (P241).

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FN1.13: FOR each ID5 on the P7 (all tasks) list:

- P241: Locate the entry on the R2 list from P1 with the ID5 for this iteration of FN1.13 in data element (3).
- P242: Identify the code in data element (2) of the R2 list entry located in P241. Is this code a 1, 2, or 3? 1 = P251; 2 = P243; 3 = P251
- P243: Locate the task identifier (ID23) in data element (1) of the R2 list entry from P241.
- P244: Locate the P26 list entry for the ID23 from P243.
- P245: Identify the value in data element (2) on the P26 list entry (as expanded in P175) from P244. This is the P177 list entry group to which this already scheduled task belongs. (Note: Already scheduled tasks can only belong to one group.)
- P246: Locate the P239 list with the value from P245 as its label.
- P247: Generate a P239 list entry. This entry consists of the ID5 for this iteration of FN1.13 and the code identified in P242. Enter this entry onto the P239 list located in P246.
- P248: Locate the P234 list with the label consisting of the P239 list entry generated in P247 (i.e., an ID5 and a code from 1 to 3).
- P249: Enter the value from P245 onto the P234 list located in P248.
- P250: GO TO P256 (next FN1.13).
- P251: Locate the P234 list with the ID5 for this iteration of FN1.13 and the code from P242 as its label.

FN1.13.1: FOR 'X' iterations (where 'X' is the value in P233, i.e., for each P239 list label):

- P252: Store the value in 'X' for this iteration of FN1.13.1 on the P234 list located in P251.
- P253: Locate the P239 list with the 'X' in this iteration of FN1.13.1 as its label.
- P254: Generate a P239 list entry. The entry consists of the ID5 for this iteration of FN1.13 and the code identified in P242. Enter this entry onto P239 list located in P253.

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P255: NEXT FN1.13.1; end of FN1.13.1, GO TO P256.

P256: NEXT FN1.13; end of FN1.13, GO TO FN1.14 (P257).

FN1.14: FOR 'X' iterations (where 'X' is the value in P233,  
i.e., for each P239 list label):

P257: Locate the P177 list entry with the value in 'X' for this iteration of FN1.14 as its data element (1).

P258: Identify the value in data element (4) (the number of time slots that make up the total length of the group defined by the P177 list entry) of the P177 list entry located in P257.

P259: Locate the P239 list with the value in 'X' for this iteration of FN1.14 as its label.

P260: Start a counter, called the P260 counter, with the value '0'. This counter will be the number of time slots required to complete all tasks in the P177 list entry group of tasks for this iteration of FN1.14.

P261: Start a counter, called the P261 counter, with the value '0'. This counter will be the number of time slots required to complete all already scheduled tasks in the P177 list entry group of tasks for this iteration of FN1.14.

P262: Start a counter, called the P262 counter, with the value '0'. This counter will be the number of time slots required to complete all currently being scheduled tasks in the P177 list entry group of tasks for this iteration of FN1.14.

P263: Start a counter, called the P263 counter, with the value '0'. This will be the counter of the number of time slots required to complete all future scheduled tasks in the P177 list entry group of tasks for this iteration of FN1.14.

P264: Start a counter, called the P264 counter, with the value '0'. This counter will be the count of the number of already scheduled tasks in the P177 list entry group for this iteration of FN1.14.

P265: Start a counter, called the P265 counter, with the value '0'. This will be the counter for the number of currently being scheduled tasks in the P177 list entry group for this iteration of FN1.14.

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P266: Start a counter, called the P266 counter, with the value '0'. This counter will be the count of the number of future scheduled tasks in the P177 list entry group for this iteration of FN1.14.

FN1.14.1: FOR each ID5 on the P239 list from P259:

P267: Locate the P239 list entry with the ID5 for this iteration of FN1.14.1 as data element (1) on the entry.

P268: Identify the code in data element (2) on the P239 list entry located in P267. Is this code a '2'? Yes = P269; No = P272 (next FN1.14.1)

P269: Add '1' to the P264 counter.

P270: Locate the entry on the R2 list from P1 with the ID5 for this iteration of FN1.14.1 in data element (3).

P271: Identify the value in data element (9) (number of time slots required) of the R2 list entry from P270. Add this value to the P260 counter and to the P261 counter.

P272: NEXT FN1.14.1; end of FN1.14.1, GO TO P273.

P273: Locate the start time slot information in data element (2) of the P177 list entry from P257.

P274: Locate the end time slot information in data element (3) of the P177 list entry from P257.

P275: Calculate the value that is equal to the value located in P258 (i.e., the length of time slots for the group of tasks in this iteration of FN1.14) minus the value in the P261 counter (number of time slots for the already scheduled tasks in this group). Store this value.

FN1.14.2: FOR each ID5 on the P245 list entry from P259:

P276: Locate the P239 list entry with the ID5 for this iteration of FN1.14.2 as data element (1) on the entry.

P277: Identify the code in data element (2) on the P239 list entry located in P276. Is this code a '2'? Yes = P307 (next FN1.14.2); No = P278

P278: Locate the entry on the R2 list from P1 with the ID5 for this iteration of FN1.14.2 in data element (3).

P279: Identify the value in data element (9) (number of time slots required) of the R2 list entry from P278.

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- P280: Is the value from P279 equal to or greater than the value located in P258? Yes (i.e., it is not possible to schedule the task in this iteration of FN1.14.2 in the group of already scheduled tasks in this iteration of FN1.14 because this task requires too large a number of time slots to complete the task to fit the task in the time available in this group of tasks) = P281; No = P285
- P281: Erase the entire P239 list entry (2 parts) identified by the ID5 for this iteration of FN1.14.2 from the P239 list located in P259.
- P282: Locate the P234 list with the ID5 for this iteration of FN1.14.2 as the first part of its label.
- P283: Erase the value for 'X' for this iteration of FN1.14 (i.e., the P177 list entry (group) label) for the P234 list located in P229.
- P284: GO TO P307 (next FN1.14.2).
- P285: Calculate the value that is equal to the value from P275 (i.e., the time slots in the P177 list entry group for this iteration of FN1.14 that are left after the already scheduled tasks for this group have been subtracted) minus the value from P279 (the time slots required for the task in this iteration of FN1.14.2). Is this value equal to or less than '1' (i.e., a '0' or a negative number)? Yes (i.e., it is not possible to schedule the task in this iteration of FN1.14.2 in the group of already scheduled tasks for this iteration of FN1.14 because after the already scheduled tasks have been scheduled, there is not sufficient numbers of time slots to schedule this task) = P281; No = P286
- P286: Examine the value in data element (4a) (due date) of the R2 list entry from P278. Is there a due date? Yes = P287; No = P289
- P287: Identify the due date in data element (4a) of the R2 list entry from P278.
- P288: Is the due date from P287 equal to or later than the end time slot information for the P177 list entry group for this iteration of FN1.14 (as determined in P274)? Yes (i.e., it is not possible to schedule the task in this iteration of FN1.14.2 in the group of already scheduled tasks in this iteration of FN1.14, because it would mean scheduling the task after its due date) = P281; No = P289
- P289: Examine the data element (4b) on the R2 list entry from P278. Are there any restrictions for this task? Yes = P290; No = P301

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- P290: Are the restrictions for this task standard restrictions, special restrictions or both? (The answer is also from data element (4b) on the R2 list entry from P278.)  
Standard restrictions = P291; Special restrictions = P296;  
Both = P291
- P291: Locate the DS26 data corresponding to the ID28 that is in data element (4b) on the R2 list entry from P278.
- P292: Identify the restricted days on the DS26 data from P291, i.e., the days of the week for which the entire day is restricted so that tasks cannot be scheduled on this day.
- P293: Is the day of the week that is part (6) of the start time slot information from P273 one of the restricted days identified in P292? Yes = P281; No = P294
- P294: Is the day of the week that is part (6) of the end time slot information from P274 one of the restricted days identified in P292? Yes = P281; No = P295
- P295: Was the answer in P290 'both'? Yes = P295 (Note: This task must be a 'currently being scheduled' task for this answer to be the answer as 'future scheduled' tasks cannot have special restrictions); No = P301
- P296: Identify the ID23 that is in data element (1) of the R2 list entry located in P278.
- P297: Locate the DS24 data corresponding to the ID23 from P296.
- P 98: Locate the special restricted days given on the DS24 data from P297.
- P299: Is the date in the start time slot information from P273 one of the restricted days identified in P298? Yes = P281; No = P300
- P300: Is the date in the end time slot information from P274 one of the restricted days identified in P298? Yes = P281; No = P301
- P301: Is the code identified in P277 a '1' or '3'? (Note: The code cannot be a '2' for P301 to have been reached.) 1 = P302; 3 = P305
- P302: Add '1' to the P265 counter.
- P303: Add the value identified in P279 to the P262 counter and to the P260 counter.



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P304: GO TO P307 (next FN1.14.2).

P305: Add '1' to the P266 counter.

P306: Add the value identified in P279 to the P263 counter and to the P260 counter.

P307: NEXT FN1.14.2; end of FN1.14.2, GO TO P308.

P308: Is the value in the P265 counter greater than '0'? Yes (i.e., there are some currently being scheduled tasks that can be scheduled next to the group of already scheduled tasks for the group in this iteration of FN1.14) = P324; No (i.e., the group of already scheduled tasks for this iteration of FN1.14 is not an option for scheduling 'currently being scheduled' tasks) = FN1.14.3 (P309)

FN1.14.3: FOR each ID5 on the P249 list located in P259 (or the P239 list located in P347, if there is a P345 flag of '2'):

P309: Locate the P233 list with the ID5 in this iteration of FN1.14.3 as the first part of its label.

P310: Erase the value from 'X' for this iteration of FN1.14 (i.e., the value for the label of a P177 list entry group) from P233 list located in P309.

P311: Is the code that is the second part of the P233 list located in P309 a '2' (already scheduled task)? Yes (i.e., because this is an already scheduled task, the P177 list entry group just erased from the P233 list for this task is the only group to which this task can belong; therefore, because this group has been eliminated as an option for scheduling tasks, the already scheduled tasks in this group are also eliminated as far as possibilities for providing tasks next to which the tasks in the R2 list entry for this iteration of FN1 can be scheduled) = P312; No = P320 (next FN1.14.3)

P312: Erase the P230 list entry located in P309.

P313: Locate the entry on the R2 list from P1 for the task with the ID5 for this iteration of FN1.14 in data element (3).

P314: Identify the ID23 in data element (1) of the R2 list entry from P313.

P315: Erase the ID23 identified in P314 from the P26 list?

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- P316: Identify the value in data element (9) (time slots required for the task) of the R2 list entry located in P313.
- P317: Subtract the value identified in P316 from the P4 counter.
- P318: Erase the R2 list entry (all 11 data elements) located in P313 from the R2 list located in P1.
- P319: Erase the ID5 for this iteration of FN1.14.3 from the P7 list.
- P320: NEXT FN1.14.3; end of FN1.14.3, GO TO P321.
- P321: Erase the P239 list located in P259 (or the P239 list located in P347, if there is a P346 flag of '2').
- P322: Erase the entire P177 list entry (all 4 data elements) for this iteration of FN1.14 from the P177 list for this iteration of FN1.
- P323 GO TO P325 (next FN1.14).
- P324: Expand the P177 list entry for this iteration of FN1.14 to have eight more data elements. These are data elements (5) through (12). Fill data elements (5) through (11) with the values in the P260 through P267 counters. Fill data element (12) with the sum of the values in the P265, P266, and P267 counters.
- P325: NEXT FN1.14; end of FN1.14, GO TO P326.
- P326: Are there any entries still on the P26 list? Yes = FN1.15 (P327); No (i.e., there are no options (groups of already scheduled tasks) left for scheduling the tasks in this iteration of FN1 next to) = P.9
- FN1.15: FOR each ID5 on the P7 list:
- P327: Locate the P234 list with the ID5 for this iteration of FN1.15 as the first part of its label.
- P328: Are there any P177 list labels on the P234 list located in P327 (i.e., are there are entries on this P234 list)? Yes = P341 (next FN1.15); No (i.e., there are no options (groups of already scheduled tasks) into which the task in this iteration of FN1.15 can be scheduled) = P329
- P329: Erase the ID5 for this iteration of FN1.15 from the P7 list.

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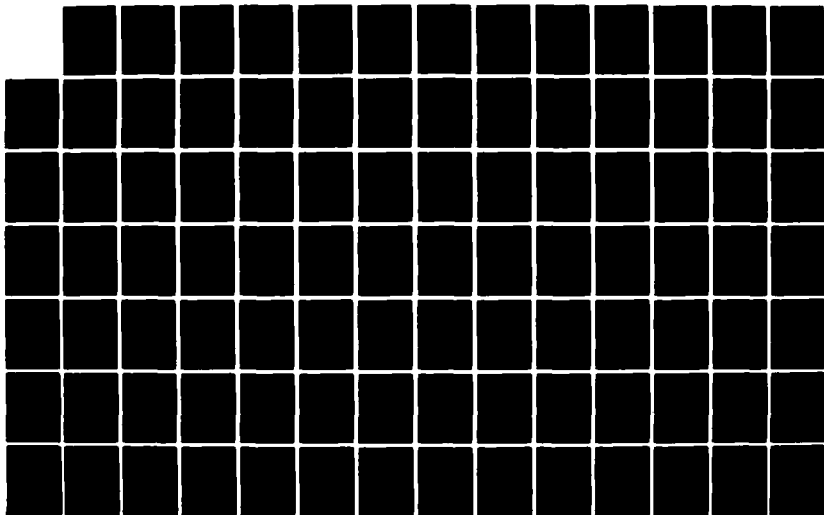
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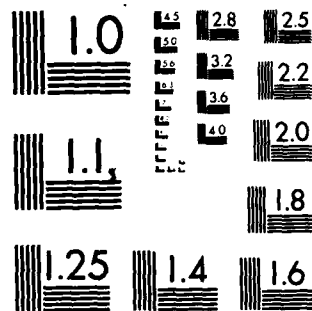
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- P330: Erase the P240 list located in P327.
- P331: Locate the entry on the R2 list from P1 that has the ID5 for this iteration of FN1.15 in data element (3).
- P332: Identify the value in data element (9) (time slots required to complete the task) of the R2 list entry located in P331.
- P333: Identify the value in data element (2) (code 1-3) of the R2 list entry located in P331. Is this value a '1' or a '3'? (Note: The code cannot be a '2' for P326 to have been answered 'No'.) 1 = P334; 3 = P338
- P334: Subtract the value identified in P332 from the P2 and P3 counters.
- P335: Identify the ID23 in data element (1) of the R2 list entry located in P331.
- P336: Erase the ID23 identified in P335 from the P21 (currently being scheduled tasks) list.
- P337: Are there still any ID23s on the P21 list? Yes = P340; No = P41
- P338: Subtract the value identified in P332 from the P2 and P5 counters.
- P339: Erase the ID5 for this iteration of FN1.15 from the P29 (future scheduled tasks) list.
- P340: Erase the entire R2 list entry (all 11 data elements) for this iteration of FN1 from the R2 list located in P1.
- P341: NEXT FN1.15; end of FN1.15, GO TO P342.
- P342: Is the ID23 for this iteration of FN1 still on the P21 list? Yes = P343; No = P45
- P343: Is there a P352 flag? Yes = P344; No = P345
- P344: Is the value in the P345 flag a '2'? Yes = P401 (next FN1.16); No = P345
- P345: Generate a flag called the P345 flag. Store the value '1' in the P346 flag. This indicates that FN1.15 has been executed once.
- FN1.16: FOR 'X' iterations (where 'X' is the value in P233, i.e., the number of entries on the original P177 list):

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- P346: Is there a P177 list entry with the value of 'X' for this iteration of FN1.16 as its data element (1)? Yes = P347; No = P401 (next FN1.16)
- P347: Locate the entry on the P177 list with the value of 'X' for this iteration of FN1.16 as its data element (1).
- P348: Identify the value in data element (4) (number of time slots in a P177 list entry group) of the P177 list entry located in P347. Store this value throughout FN1.16.
- P349: Begin generating a list, called the P349 list. A P349 list defines the time slots contained in a particular P177 list entry group. Generate a new such P349 list each time P349 is executed; do not erase previous P349 lists generated during this FN1, i.e., retain the P349 lists throughout FN1. Put the value for 'X' in this iteration of FN1.16 as the label of the P349 list.

There is an entry on the P349 list for each time slot in the length of time contained in the P177 list entry group for this iteration of FN1.16 as defined in P348. Each such entry on the P349 list consists of 7 data elements:

- (1) A number from '1' to 'X' (where 'X' is the value from P348).

Time slot information; in this case, this will consist of five parts (data elements (2) through (6)):

- (2) Year;
- (3) Month;
- (4) Day of the month (1-31);
- (5) Time slot number (1-96); and,
- (6) Day of the week
- (7) A flag indicating whether this time slot has been tentatively scheduled. (Note: This data element will not be completed until much later in the Step F4A-3 program. If there is a flag of 'S', it means the time slot is tentatively scheduled; if there is a flag of 'I', it means that this time slot is an interruption in a task that has been tentatively scheduled; such interruptions are treated as tentatively scheduled time slots in order to avoid scheduling other tasks in these time slots. If there is no flag, then the time slot has not been tentatively scheduled.)

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- P350: Identify the 6 part start time slot information in data element (2) of the P177 list entry located in P347.
- P351: Identify the 6 part end time slot information in data element (3) of the P177 list entry located in P347.
- P352: Start a counter, called the P352 counter. Fill in the counter with the value in part 2 (year) of the start time slot information obtained in P350.
- P353: Start a counter, called the P353 counter. Fill the counter with the value in part 3 (month) of the start time slot information obtained in P350.
- P354: Start a counter, called the P354 counter. Fill the counter with the value in part 4 (day of the month) of the start time slot information obtained in P350.
- P355: Start a counter, called the P355 counter. Fill the counter with the value in part 5 (time slot number) of the start time slot information obtained in P350.
- P356: Start a counter, called the P356 counter. Fill the counter with the value in part 6 (day of the week) of the start time slot information obtained in P350.

FN1.16.1: FOR 'X' iterations (where 'X' is the value from P348):

- P357: Generate an entry on the P349 list being generated for this iteration of FN1.16. Put the value of 'X' for this iteration of FN1.16.1 as data element (1) on this entry. Data elements (2) through (6) for this P349 list entry should be the values in counters P352 through P356, respectively.
- P358: Add '1' time slot to the P352 through P356 counters. To do this, follow these Process Substeps (PS):
- PS1: Is the value in the P355 (time slot number) equal to '96'? Yes = PS4; No = PS2
- PS2: Add '1' to the P355 counter.
- PS3: GO TO P359 (next FN1.16.1).
- PS4: Is the value in the P356 (day of the week) counter equal to '7'? Yes = PS7; No = PS5
- PS5: Add '1' to the P356 counter.
- PS6: GO TO PS8.

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PS7: Set the P356 counter as a '1'.

PS8: Use the R6 list to determine the number of days in a month for the month in the P353 counter (and, if necessary, the year in the P352 counter).

PS9: Is the value in the P354 (day of the month) counter equal to the last day of the month (as determined in PS8)? Yes = PS12; No = PS10

PS10: Add '1' to the P354 counter.

PS11: GO TO P359 (next FN1.16.1).

PS12: Set the P354 counter to a '1'.

PS13: Is the value in the P353 (month) counter equal to a '12'? Yes = PS16; No = PS14

PS14: Add '1' to the P353 counter.

PS15: GO TO P359 (next FN1.16.1).

PS16: Set the value in the P353 counter to a '1'.

PS17: Add '1' to the value in the P352 (year) counter.

PS18: GO TO P359 (next FN1.16.1).

P359: NEXT FN1.16.1; end of FN1.16.1, GO TO P360.

P360: Locate the P239 list with the value of 'X' for this iteration of FN1.16 as its label.

FN1.16.2: FOR each entry on the P239 list from P360 (i.e., each task in the P177 list entry group for this iteration of FN1.16):

P361: Begin generating a list called the P361 list. This list is a copy of the P349 list, but it is for a single task that is covered by this iteration of FN1.16.2 rather than for the entire set of tasks in FN1.16. Generate a separate P361 list each time P361 is executed; store these lists throughout FN1.

Each P361 list has a 2 part label. Part (1) consists of the value of 'X' for this iteration of FN1.16. Part (2) is a requirement application identifier (ID5).

Each P361 list has the following five data elements at the top of the list (i.e., before the entries on the list begin):



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- (1) The code (1-3) indicating whether this is a currently being scheduled, already scheduled or future scheduled task.
- (2) The total number of restricted time slots on the P361 list for this task.
- (3) The total number of time slots required to complete this task.
- (4) The total time slots (entries) on this P361 list.
- (5) Whether it is possible to schedule this task using this scheduling option.

Each P361 list consists of the same number of entries as the P349 list. Each entry on the P361 list consists of 7 data elements. The first 6 data elements are the same as the data elements in the corresponding entry on the P349 list, i.e., a sequential number for the time slot, the year, the month, the day of the month, the time slot number (1-96), and the day of the week. Data element (7) consists of a Yes/No answer to whether the time slot represented by this entry on the P368 list is a restricted time slot for this task.

- P362: Locate the P239 list entry corresponding to this iteration of FN1.16.2.
- P363: Identify the ID5 in data element (1) on the P239 list entry located in P362.
- P364: Identify the code (1-3) in data element (2) of the P239 list entry located in P362.
- P365: Locate the entry on the R2 list from P1 that consists the ID5 located in P363 in data element (3).
- P366: Identify the value in data element (9) (time slots required to complete the task) on the R2 list entry located in P365.
- P367: Begin to fill in the P361 list newly generated in this iteration of FN1.16.2. Part (1) of the label is the value for 'X' for this iteration of FN1.16. Part (2) of the label is the ID5 from P363.

Part (1) of the data elements at the top of the P361 list (i.e., before the entries begin) is the code from P364. Part (2) of the data elements at the top of the P361 list is left blank at this point. Part (3) of the data elements at the top of the P361 list is the value from

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P366. Part (4) of the data elements at the top of the P361 list is the value from P348. Fill in the first 6 data elements of all of the entries on the P361 list by copying the corresponding 6 data elements from the P349 list.

P368: Examine data element (4b) on the R2 list entry from P365. Are there any restrictions for the task in this iteration of FN1.16.2? Yes = P371; No = P369

P369: Fill in part (2) of the data elements at the top of the P361 list with an '0' (i.e., there are no restricted time slots on this P361 list).

P370: GO TO P398 (next FN1.16.2).

P371: Are the restrictions for this task standard restrictions? (Note: This answer is also in data element (4) on the R2 list entry from P365.) Yes = P372; No = P369

P372: Locate the DS26 data corresponding to the weekly schedule identifier (ID28) that is in data element (4b) on the R2 list entry from P365.

FN1.16.2.1: FOR each entry on the newly generated P361 list:

P373: Identify the values in data element (6) (day of the week) and data element (5) (time slot number) on the P361 list entry for this iteration of FN1.16.2.1.

P374: On the DS26 data from P372 locate the time slot corresponding to the day of the week (1-7) and the time slot number (1-96) identified in P373.

P375: Does the DS26 data from P372 show that the time slot identified in P374 is available for scheduling, i.e., has a 'Yes' (not restricted) for this time slot? Yes = P376; No = P378

P376: Mark data element (7) of the P361 entry for this iteration of FN1.16.2.1 with the code 'Yes' (i.e., not restricted).

P377: GO TO P380 (next FN1.16.2.1).

P378: Mark data element (7) of the P361 list entry for this iteration of FN1.16.2.1 with the code for 'No' (i.e., restricted).

P379: Add '1' to the value stored in part (2) of the data elements at the top of the newly generated P361 list.

P380: NEXT FN1.16.2.1; end of FN1.16.2.1, GO TO P381.

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- P381: Is the code located in P364 a '2'? Yes = P400 (next FN1.16.2); No = P382
- P382: Derive the sum of the values in part (2) (restricted time slots) and part (3) (time slots required for the task) of the data elements at the top of the newly generated P361 list.
- P383: Is the sum derived in P382 equal to or greater than the value in part (4) (time slots on the P361 list) of the data elements at the top of the newly generated P361 list? Yes (i.e., it is not possible to schedule the task in this iteration of FN1.16.2 in the group of tasks in this iteration of FN1.16 because, when restricted time slots are considered, there are not sufficient numbers of time slots in this group to schedule the task) = P387; No = P384
- P384: Identify the value in data element (6) (time slots required to complete the already scheduled tasks for this P177 list entry group) of the P177 list entry located in P347.
- P385: Derive the sum of the value derived in P382 and the value identified in P384.
- P386: Is the sum derived in P385 greater than the value in part (4) (time slots, i.e., entries on the P361 list) of the data elements at the top of the newly generated P361 list? Yes = P387; No = P398 (next FN1.16.2)
- P387: Erase the entire P239 list entry (2 data elements) for this iteration of FN1.16.2 from the P239 list located in P360.
- P388: Locate the P234 list with the ID5 from P363 as the first part of its label.
- P389: Erase the entry on the P234 list located in P388 that is equal to the value for 'X' for this iteration of FN1.16.
- P390: Locate data element (5) on the P177 list entry located in P347.
- P391: Subtract the value identified in P366 from the value in data element (5) located in P390. This remainder is the new value for data element (5) of the P177 list entry located in P347.

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- P392: Is the code identified in P364 a '1' or '3'? (Note: It cannot be a '2', because of the answer in P277.) 1 = P393; 3 = P396
- P393: Subtract '1' from the value in data element (10) (number of currently being scheduled tasks) and data element (12) (total number of tasks) of the P177 list entry located in P347.
- P394: Subtract the value identified in P366 from the value in data element (7) (currently being scheduled time slots) of the P177 list entry located in P347.
- P395: GO TO P398 (next FN1.16.2).
- P396: Subtract '1' from the value in data element (11) (number of future scheduled tasks) and data element (12) (total number of tasks) of the P177 list entry located in P347.
- P397: Subtract the value identified in P366 from the value in data element (8) (future scheduled time slots) of the P177 list entry located in P347.
- P398: NEXT FN1.16.2; end of FN1.16.2, GO TO P399.
- P399: Add '1' to the P345 flag.
- P400: Is the value in data element (10) (number of currently being scheduled tasks) of the P177 list entry from P347 a '0'? Yes = FN1.14.3 (P309); No = P401 (next FN1.16)
- P401: (From P344 and P400) NEXT FN1.16; end of FN1.16, GO TO FN1.17 (P403).
- P402: Start a list called the P402 list. This is a list of the employee identifier (ID4) group numbers indicating to which group of users capable of performing certain types of tasks (CT8s) a task belongs.
- FN1.17: FOR each entry on the R2 list from P1:
- P403: Identify the value (1-99) in data element (11) (i.e., the employee identifier (ID4) group number indicating to which group of users capable of performing this task, the task in this iteration of FN1.17 belongs) on the R2 list entry for this iteration of FN1.17.
- P404: Is the value identified in P403 on the P402 list? Yes = P409 (next FN1.17); No = P405.

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- P405: Place the value from P403 onto the P402 list.
- P406: Identify data element (6) (task type code (CT8)) on the R2 list entry for this iteration of FN1.17. Also identify data element (5) (OHMIS service area identifier (ID10)).
- P407: Using the DL34 list, identify all of the employee identifiers (ID4) for the same CT8 and ID10 as those identified in P406.
- P408: Generate a list, called the P408 list. (Generate a new P408 list each time P408 is executed; i.e., do not erase previous P408 lists; retain the P408 lists throughout this iteration of FN1.) Put the value identified in P403 as the label on the P408 list generated in this iteration of FN1.17. Add the ID4s identified in P407 as the entries on the P408 list.
- P409: NEXT FN1.17; end of FN1.17, GO TO FN1.18 (P410).
- P410: Identify the first ID23 on the P26 list.
- P411: Locate the DS24 data corresponding to the ID23 from P410.
- P412: Identify the OHMIS service area identifier (ID10) on the DS24 data from P411. Store this ID10 throughout FN1.
- FN1.18: FOR 'X' iterations (where 'X' is the value in P233, i.e., the number of entries on the original P177 list):
- P413: Is there a P177 list entry with the value of 'X' for this iteration of FN1.16 as its data element (1)? Yes = P414; No = P475 (next FN1.18)
- P414: Start a list, called the P414 list. This is a list of the employee identifier (ID4) group numbers indicating to which group of user is capable of performing certain types of tasks (CT8) a task belongs, for a given P177 list entry group. That is, it is the same type of list as the P402 list, but it is for a given P177 list entry group. Place the value of 'X' for this iteration of FN1.18 as the label on the new P414 list. Retain the P414 list throughout this iteration of FN1, i.e., do not erase previously generated P414 lists for this iteration of FN1.
- P415: Start a list, called the P415 list. This is the list of employee identifiers (ID4s) that are capable of performing any one task in the P177 list group of tasks for this iteration of FN1.18 and associated scheduling information for each of these ID4s. Retain the P415 list throughout this iteration of FN1; i.e., do not erase other P415 lists generated in this iteration of FN1.

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Each P415 list will have a series of entries. Each P415 list entry will consist of 5 data elements:

- (1) An employee identifier (ID4) that is one of the users qualified to perform one or more of the tasks in the P177 list entry group covered by this P415 list
- (2) A monthly schedule identifier (ID27). This identifies the particular monthly schedule data (DS27) that contains the time slots covered in the P177 list entry group covered by the P415 list for the ID4 in data element (1)
- (3) A second ID27. If the time slots covered in the P177 list entry group for this P415 list include more than one month (i.e., if the maximum of 9 hours covered on any P177 list entry group goes onto more than one day and the two days include the last and first days of two months), then there will need to be two ID27s to cover the two months in the time slots for the P177 list entry group. This data element will be the same as the ID27 in data element (2), if there is only one month covered by the P177 list entry group.
- (4) Whether data element (2) and data element (3) of this P415 list entry (i.e., the ID27s) identify the same set of DS27 data for which one of the already scheduled tasks around which the P177 list entry group for this iteration of FN1.18 were formed
- (5) The number of time slots not available for scheduling on the two DS27 monthly schedules in data element (2) and data element (3) from among the time slots included in the P177 list entry group for this iteration of FN1.18

Place the value of 'X' for this iteration of FN1.18 as the label for this P415 list. The rest of the data elements on the P415 list are left blank at this time.

P416: Start a list of pairs of monthly schedule identifiers (ID27) that are for the monthly scheduled data (DS27) of the already scheduled tasks for the P177 list entry group in this iteration of FN1.18. (Note: Pairs of ID27s are needed because DS27 data only covers one month and a given already scheduled task may take more than one day and the second day may go onto a second month, thus resulting in two ID27s to describe the time slots for which the task is scheduled. There cannot be more than 2, however, because

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already scheduled tasks taking longer than 32 time slots (8 hours) have been removed from the R2 list from P1.)

FN1.18.1: FOR each entry on the P26 (already scheduled tasks) lists:

- P417: Identify the value in data element (2) (the P177 list entry group number) of the P26 list entry for this iteration of 1.18.1. (Note: The P26 list entry was expanded in P175.)
- P418: Is the value identified in P417 the same as the value from 'X' in this iteration of FN1.18? Yes = P419; No = P425 (next FN1.18.1)
- P419: Identify the task identifier (ID23) in data element (1) of the P26 list entry for this iteration of FN1.18.1
- P420: Locate the entry on the R2 list from P1 with the ID23 from P419 in data element (1).
- P421: Identify part (1) (i.e., an ID27) of the start time slot information that is in data element (10a) of the R2 list entry located in P420.
- P422: Identify part (1) (i.e., an ID27) of the end time slot information that is in data element (10b) of the R2 list entry located in P420.
- P423: Is the pair of ID27s identified in P421 and P422 already on P416 list? Yes = P425 (next FN1.18.1); No = P424
- P424: Add the pair of ID27s from P421 and P422 to the P416 list.
- P425: NEXT FN1.18.1; end of FN1.18.1, GO TO P426.
- P426: Locate the P239 list with the value of 'X' for this iteration of FN1.18 as its label.

FN1.18.2: FOR each task (as identified by a requirement application identifier (ID5)) on the P239 list located in P426:

- P427: Locate the entry on the R2 list from P1 with the ID5 for this iteration of FN1.18.2 as its label.
- P428: Identify the value in data element (11) (task performer group number) of the R2 list entry identified in P427.
- P429: Is the value identified in P428 on the P414 list for this iteration of FN1.18? Yes = P435 (next FN1.18.2); No = P430

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P430: Place the value identified in P428 onto the P414 list for this iteration of FN1.18.

P431: Locate the P408 list with the value from P428 as its label.

FN1.18.2.1: FOR each ID4 on the P408 list located in P431:

P432: Is the ID4 for this iteration of FN1.18.2.1 on the P415 list, i.e., in data element (1) of a P415 list entry? Yes = P434( next FN1.18.2.1); No = P433

P433: Place the ID4 for this iteration of FN1.18.2.1 as data element (1) of a new entry on the P415 list.

P434: NEXT FN1.18.2.1; end of FN1.18.2.1, GO TO P435.

P435: NEXT FN1.18.2; end of FN1.18.2, GO TO P436.

P436: Locate the P177 list entry with the value of 'X' in this iteration of FN1.18 as its data element (1).

P437: Identify the start time slot information that in data element (2) of the P177 list entry located in P436.

P438: Identify the end time slot information that is in data element (3) of the P177 list entry from P436.

P439: Identify the value in data element (4) (number of time slots in the P177 list entry group) of the P177 list entry located in P436. Store this value throughout FN1.18.

FN1.18.3: FOR each entry on the P415 list generated in this iteration of FN1.18:

P440: Identify the employee identifier (ID4) in data element (1) on the P415 list entry for this iteration of FN1.18.3.

P441: Determine if there is a DL41 list entry (monthly schedule identifiers (ID27) that corresponds to the OHMIS service area identifier (ID10) from P412, the ID4 from P440 and the year (part (2)) and the month (part (3)) of the start time information from P437. Yes = P446; No = P442

P442: Examine the DL40 list and determine if there are any entries (i.e., weekly schedule identifiers (ID28)) for the ID10 from P412 and the ID4 from P440 and for which the DS26 data corresponding to the ID28 covers the year and month and day that are parts (2), (3) and (4) of the start time information from P437. Yes = P444; No (i.e., the ID4 from P440 cannot be used as a person for whom the tasks in



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the P177 list entry group for this iteration of FN1.18 belongs can be scheduled, because there is no schedule availability data (DS26) for this user for the time period covered by the P177 list entry group) = P443

- P443: Erase the entire P415 list entry (all 5 data elements, only one of which will have been filled at this time) for this iteration of FN1.18.3 from the P415 list generated in this iteration of FN1.18. GO TO P474 (next FN1.18.3).
- P444: Generate a flag indicating that it was necessary to go to the Function F4C subroutine from P444 of Step F4A-3 and that the program should return to P446 of Step F4A-3, when Function F4C is completed. Retain this flag throughout the time that the user is logged onto the system or until this flag has been erased at completion of F4C.
- P445: Retain all temporary flags, lists and records generated and in existence at the time that P441 is executed (or at the time that P446 is executed, if there is a flag in P448). Retain the ID10 from P412, the ID4 from P440 and the year (part (2)) and the month (part (3)) of the start time slot information from P437 (or the end time slot information from P438, if there is a P448 flag). These data elements will be used in Function F4C. GO TO F1 of Step F4C.
- P446: Determine if there is a DL41 list entry that corresponds to the ID10 from P412, the ID4 from P440 and the year and month of the end time slot information from P438. Yes = P449; No = P447
- P447: Examine the DS40 list and determine if there are any entries (ID28s) for the ID10 from P412 and the ID10 from P440 and for which the DS26 data covers the year and month and day that are parts (2), (3) and (4) of the end time slot information from P438. Yes = P448; No = P443
- P448: Generate a flag as in P444 except that the flag should indicate that the program exited from P447 (not P442) and should return to P449 (not P446). GO TO P445.
- P449: Using the DL41 list, identify the ID27 that corresponds to the OHMIS service area (ID10) from P412, the ID4 from P440, and the year (part (2)) and the month (part (3)) of the start time information from P437.
- P450: Using the DL41 list, identify the ID27 that corresponds to the OHMIS service area (ID10) from P412, the ID4 from P440, and the year (part (2)) and the month (part (3)) of the end time slot information from P438.

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- P451: Enter the ID27s from P449 and P450 onto data elements (2) and (3) respectively of the P415 list entry for this iteration of FN1.18.3.
- P452: Is the pair of ID27s from P449 and P450 on the P416 list?  
Yes = P453; No = P454
- P453: Fill in data element (4) on the P415 list entry for this iteration of FN1.18.3 with a code meaning 'Yes'. GO TO P456.
- P454: Fill in data element (4) on the P415 list entry for this iteration of FN1.18.3 with a code meaning 'No'.
- P455: Start a list, called the P455 list. Generate a new such list each time P455 is executed; i.e., do not erase P455 lists until this iteration of FN1 is completed. The P455 list consists of the scheduling availability information for a set of DS27 data (or a pair of DS27 data sets) that corresponds to a particular employee identifier (ID4) and a particular P177 list entry group.

The label of each P455 list consists of 5 parts. These five parts are the same as the five data elements to a P415 list entry, i.e., (1) a P177 list entry group number; (2) the first monthly schedule identifier (ID27); (3) the second ID27; (4) whether the ID27s in (2) and (3) make up a scheduling option containing an already scheduled task for this iteration of FN1.18; and (5) the number of time slots not available for this set of DS27 data from among the time slots for this set of P177 list entry group time slots. Fill in the P455 list label for the P455 list generated in this iteration of FN1.18.3 with the values on the P415 list entry for this iteration of FN1.18.3.

Each entry on the P455 list consists of five data elements:

- (1) A sequentially assigned number indicating the count of P455 list entries. This is a number starting with (1) and ending with (X) (where 'X' is the value from P439, i.e., the number of P177 list group entries)
- (2) A monthly schedule identifier (ID27)
- (3) A day of the month (1-31)
- (4) A time slot number (1-96)
- (5) Whether this time slot is available for scheduling. The presence of a code indicates that this time

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slot is not available for scheduling; a blank in this data element indicates that it is available for scheduling. Two codes ('B' or 'T') may be put in this field. A 'B' indicates that the time slot is not available for scheduling because of a 'break' (user's time is not available); a 'T' indicates that the slot is not available because another task is scheduled here.

- P456: Start a counter, called the P456 counter. Fill the counter with the value in part (4) (day of the month) of the start time slot information identified in P437.
- P457: Start a counter, called the P457 counter. Fill this counter with the value in part (5) (time slot number) of the start time slot information identified in P437.
- P458: Generate a flag, called the P458 flag. Store the value of '1' in the P458 flag, thereby indicating that FN1.18.3.1 should use the first DS27 data (i.e., the DS27 data corresponding to the ID27 from P449, not P450).
- FN1.18.3.1: FOR 'X' iterations (where 'X' is the value from P439, i.e., the number of time slots in the P177 list entry group for this iteration of FN1.18):
- P459: Is the P458 flag a '1' or a '2'? 1 = P460; 2 = P462
- P460: Locate the DS27 data corresponding to the ID27 identified in P449. Start adding an entry to the newly generated P455 list. Data element (1) is the value for 'X' in this iteration of FN1.18.3.1. Data element (2) is the ID27 from P449. Data elements (3) and (4) are the values in the P456 and P457 counters respectively.
- P461: GO TO P463.
- P462: Locate the DS27 data corresponding to the ID27 identified in P450. Start adding an entry to the P455 list; follow the instructions in P460, except data element (2) is the ID27 from P450, not P449.
- P463: Locate the time slot on the DS27 data for this iteration of FN1.18.3.1 (i.e., the DS27 data from P460 or P462) that is for the day of the month with the value in the P456 counter and the time slot number with the value in the P457 counter.
- P464: Is the time slot from P463 available for scheduling? (Note: This information and that for answering the P465 through P470 questions is given on the DS27 data for this iteration of FN1.18.3.1 as identified in P460 or P462.)

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Yes = P465; No (i.e., this time slot is not available for scheduling) = P471

P465: Is the time slot from P463 currently already scheduled?  
Yes = P466; No (i.e., this time slot is available for scheduling) = P472

P466: Is the task in the P463 time slot one for which the user specified the schedule? Yes (i.e., this task cannot be rescheduled) = P471; No = P467

P467: Is the task scheduled in the P463 time slot, one of those on the P26 (already scheduled tasks) list for this iteration of FN1? (Note: To determine this, compare the task identifier (ID23) on the DS27 data with the ID23s on the P26 list.) Yes (i.e., this task can be rescheduled) = P472; No = P468

P468: Is the task scheduled in the P464 time slot for an 'employee transport' type of task? Yes (i.e., this task cannot be rescheduled) = P471; No = P469

P469: Is the task in the P463 time slot one for which there are special restrictions? Yes (i.e., this task cannot be rescheduled) = P471; No = P470

P470: Is the task in the P463 time slot one for which a Scheduling Notice (015) is supposed to be generated? Yes (i.e., this task cannot be rescheduled) = P471; No = P472

P471: Add '1' to the value in data element (5) of the P415 list entry for this iteration of FN1.18.3. Also enter a code in data element (5) of the P455 list entry generated in P460 (or P462). This code should be a 'B' if P464 was answered 'No'; otherwise, the code is a 'T'.

P472: Add '1' time slot to the P456 and the P457 counters, and, if applicable, change the flag in P458. To do this, follow these Processing Substeps (PS):

PS1: Is the value in the P457 counter (time slot number) equal to a '96'? Yes = PS4; No = PS2

PS2: Add '1' to the P457 counter.

PS3: GO TO P473 (next FN1.18.3.1).

PS4: Set the P457 counter to '1'.

PS5: Identify the value in part (2) (year) and part (3) (month) of the P437 time slot information.

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- PS6: Use the R6 list to determine the number of days in a month for the month (and, if necessary, year) with the value identified in PS5.
- PS7: Is the value in the P456 counter (day of the month) equal to the last day of the month (as determined in PS6)? Yes = PS8; No = PS10
- PS8: Set the P456 counter to '1'.
- PS9: GO TO PS11.
- PS10: Add '1' to the value in the P456 counter.
- PS11: Is the P458 flag a '1' or '2'? 1 = PS12; 2 = P473 (next FN1.18.3.1)
- PS12: Change the P458 flag to a '2'.
- PS13: GO TO P473 (next FN1.18.3.1).

P473: NEXT FN1.18.3.1; end of FN1.18.3.1, GO TO P474.

P474: NEXT FN1.18.3; end of FN1.18.3, GO TO P475.

P475: NEXT FN1.18; end of FN1.18, GO TO FN1.19 (P476).

FN1.19: FOR each entry on the P402 list (i.e., for each user group number from data element (11) on an R2 list entry):

P476: Start a list, called the P476 list. This list will resemble the P415 list, except that, while the P415 list is a list of all of the scheduling information (options) for a given P177 list entry group, the P476 list will contain all of the scheduling information for a given group of users capable of performing certain tasks, i.e., the groups identified in data element (11) on R2 list entries. Generate a new P476 list each time P476 is executed; retain all P476 lists throughout FN1.

Place the value in the P402 list entry for this iteration of FN1.19 as the label on the P476 list generated at this time.

At the top of each P476 list there will be a count of the number of entries on the P476 list. Start this data element with the value '0'.

Each P476 list will consist of a series of entries. Each entry will consist of 7 data elements. Data elements (1) through (5) are the same as data elements (1) through (5) on a P415 list. Data element (6) consists of the value

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that is the label on the P415 list from which the P476 list entry was copied. Data element (7) will be a sequential number to assign a unique number to each P476 list entry.

P477: Locate the P408 list corresponding to the P402 entry for this iteration of FN1.19.

FN1.19.1: FOR each ID4 on the P408 list located in P477:

FN1.19.1.1: FOR 'X' iterations (where 'X' is the value in P233, i.e., the number of entries on the original P177 list):

P478: Is there a P177 list entry with the value of 'X' for this iteration of FN1.16 as its data element (1)? Yes = P479; No = P488 (next FN1.19.1.1)

P479: Locate the P415 list with the value of 'X' for this iteration of FN1.19.1.1 as its label.

FN1.19.1.1.1: FOR each entry on the P415 list located in P479:

P480: Identify the employee identifier (ID4) in data element (1) of the P415 list entry for this iteration of FN1.19.1.1.1.

P481: Is the ID4 from P480 the same as the ID4 for this iteration of FN1.19.1? Yes = P482; No = P487 (next FN1.19.1.1.1)

P482: Generate a new P476 list entry. Use the entire P415 list entry (all 5 data elements) from this iteration of FN1.19.1.1.1 as data elements (1) through (5) of the new P476 list entry. Use the value of 'X' for this iteration of FN1.19.1.1 as data element (6) for this new P476 list entry. Add '1' to the data element at the top of the P476 list. Enter the sum in the data element at the top of the P476 list as data element (7).

P483: Identify the value in data element (4) (whether this is the ID27 from one of the 'already scheduled' tasks) on the newly generated P476 list entry for this iteration of FN1.19.1.1.1. Is the value a 'Yes' or 'No'? Yes = P484; No = P486

P484: Enter the P476 list entry generated in P482 onto the top of the P476 list generated in this iteration of FN1.19. (Note: It is important that the entry be put on the top of (i.e., in front of all other entries) on the P476 list in order that scheduling options (ID27s) that include the already scheduled tasks will be given higher priority than other options on the P476 lists. The other options on the P476 lists will be scheduling options for the same time

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period as the already scheduled task (where the time period is defined by the P177 list entry group), but which are not performed by the same user (employer identifier (ID4)) and therefore are scheduled on a different set of DS27 data and therefore have a different ID27.)

P485: GO TO P486 (next FN1.19.1.1.1).

P486: Enter the P476 list entry generated in P482 onto the bottom of (i.e., after all other entries) of the P476 list generated in this iteration of FN1.19).

P487: NEXT FN1.19.1.1.1; end of FN1.19.1.1.1, GO TO P488.

P488: NEXT FN1.19.1.1; end of FN1.19.1.1, GO TO P489.

P489: NEXT FN1.19.1; end of FN1.19.1, GO TO P490.

P490: NEXT FN1.19; end of FN1.19, GO TO P991.

P491: (From P1025): Store a flag, called the P491 flag. This flag will indicate whether the search for scheduling options for this iteration of FN1 is on its first iteration at this point in the program logic. Store the value of 'A' in this flag.

P492: Start a list, called the P492 list. This list gives the status of the search for scheduling options for each task on the R2 list from P1 for this iteration of FN1. Each entry on the P492 list consists of 11 data elements:

- (1) A requirement application identifier (ID5), uniquely identifying a task.
- (2) A code (1-3) indicating whether the task is a currently being scheduled, already scheduled or future scheduled task.
- (3) A flag indicating the point in the search for scheduling options at which this task is in the program logic.
- (4) A value indicating the number of entries on the P476 list for this task. This value is at the top of each P476 list.
- (5) A counting number indicating the point in the P476 list at which the search for scheduling options is for this task at this point in the program logic. This number identifies the value in data element (7) on the P476 list entry. This counter will be

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left blank if the code in data element (9a) is 'NC' (No Change).

- (6) A number (1-'X', where 'X' is the number of entries on the P492 list) assigned to each P492 list entry so that it has a unique value.
- (7) A counting number indicating the point on the P361 list identified in data element (6) at which the scheduling option most recently generated for this task began. Left blank if 'NC' code is in data element (9a).
- (8) Whether this task has reached the end of a search for scheduling options. Answers: Yes/No
- (9a) Code of 'M', 'B' or 'NC' indicating where the next search for scheduling options for this task should take place, i.e., it should:
  - o Begin from the Marker in data element (7), as indicated by a code of 'M';
  - o Begin at the Beginning of all scheduling options for this task, i.e., with the first entry on the P476 list and the first entry on the corresponding P361 list for this task, as indicated by a code of 'B'; or,
  - o Not change the scheduling option identified in a previous search for scheduling options for this task as indicated by the code of 'NC'.
- (9b) If 'NC' is the value entered in data element (9a), then (9b) indicates whether the previous scheduling option was from a P528 (code 'a') list or a P529 (code 'b') list should also be indicated.
- (10) Whether this task is one for which there is only one scheduling option, i.e., it is an 'already scheduled' task (code (2) in data element (2) above) for which the schedule was specified by the user. Answers: Yes/No

FN1.20: FOR each ID5 on the P7 list:

- P493: Locate the entry on the R2 list from P1 with the value of the ID5 for this iteration of FN1.20 in data element (3).
- P494: Identify the code (1-3) in data element (2) of the R2 list entry from P493.



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- P495: Identify the value in data element (11) (task performer group) of the R2 list entry from P493.
- P496: Locate the P476 list entry with the value from P495 as its label.
- P497: Identify the value in the 1 data element at the top of the P476 list located in P496, i.e., the total number of entries on this P476 list.
- P498: Generate a partial P492 list entry. Put the ID5 from this iteration from FN1.20 in data element (1); the code from P494 in data element (2); the flag of '1' in data element (3); and, the value from P497 in data element (4). If the code from P494 was a '1' or a '3', place the value of '1' in data elements (5) and (7) and place the code 'B' (beginning) in data element (9a). If the P494 code is '2', leave data elements (5) and (7) blank and place the code 'NC' in data element (9a) and code 'a' (P528 list) in data element (9b). Place the answer 'No' in data element (8). Data element (6) should be a unique number assigned to each P492 entry beginning with '1' (first entry) and ending with the value equal to the total number of P492 list entries (on the last entry on the P492 list).
- P499: Is the code from P494 a '2' (already scheduled task)? Yes = P500; No = P503
- P500: Identify the answer (Yes/No) in data element (10e) (whether this already task's schedule was specified by the user) of the R2 list entry located in P493. Is the answer a 'Yes' or 'No'? Yes = P501; No = P503
- P501: Put the answer 'Yes' in data element (10) (whether this is a user specified schedule) of the newly generated P492 list entry.
- P502: GO TO P504.
- P503: Put the answer 'No' in data element (10) of the newly generated P492 list entry.
- P504: Is the code from P494 a '1', '2' or '3'? 1 = P505; 2 = P507; 3 = P509
- P505: Put the newly generated P492 list entry on a temporary list called the P505 list.
- P506: GO TO P510 (next FN1.20).

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- P507: Put the newly generated P492 list entry on a temporary list, called the P507 list.
- P508: GO TO P510 (next FN1.20).
- P509: Put the newly generated P492 list entry on a temporary list, called the P509 list.
- P510: NEXT FN1.20; end of FN1.20, GO TO P511.
- P511: Enter the entries on the P507 list onto the P492 list.
- P512: Enter the entries on the P505 list onto the P492 list at the end of the entries already on the P492 list.
- P513: Enter the entries on the P509 list onto the P492 list at the end of the entries already on the P492 list.
- P514: Erase the P505, P507 and P509 lists.
- P515: Start a list, called the P515 list. This list will contain pairs of monthly schedule identifiers (ID27s) for each pair of ID27s used in a particular "combination of task scheduling options".
- P516: Start a list, called the P516 list. This list will be the list of combination of task scheduling options that is currently being formed in a given search for scheduling options. (Note: A combination of task scheduling options is the phrase used to refer to a particular group of scheduling options covering one or more of the tasks in the R2 list from P1. Each task on the R2 list from P1 may have a scheduling option identified. However, it is necessary that the scheduling options for different tasks do not overlap, i.e., do not use the same calendar time slots), the basis for selection of the best task scheduling options must be based on the best combination of non-overlapping task scheduling options. In the program logic that follows, the program first identifies scheduling options for each task, if possible, based on certain criteria. (The criteria selected depends on the flag in data element (3) of the P492 list entry for the task.) As a scheduling option is identified for each task, the calendar time slots covered by that schedule are blocked out (on the P349 list for the corresponding calendar time slots, i.e., for the corresponding P177 list entry group) so that they cannot be used for any other task scheduling options. The task scheduling option thus generated is described by placing information about the option on a P528, P529 or P530 list. When an attempt has been made to identify a scheduling option for all tasks on the R2 list from P1, the combination of each task

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scheduling option is examined (using the data describing this combination on the P516 list) to determine if it is optimal, e.g., fewest number of interruptions, fewest number of tasks that need to be rescheduled, etc.)

The P516 list will have 5 data elements at the top of the list (before the entries begin):

- (1) A count of the number of entries on the P516 list. Store the value of '0' in this counter at this point.
- (2a)-(2d) Four counters, called the (2a) through (2d) counters. Fill each counter with the value of '0'. These counters will be the counters of the number of currently being scheduled (2a), already scheduled (2b), future scheduled (2c) and total (2d) tasks scheduled in the combination of task scheduling options represented by the current P516 list.
- (3a)-(3d) The same as (2a) through (2d), except these are the counters for the not scheduled tasks in this combination of task scheduling options.
- (4) A count of the number of time slots that are in incorrect time use codes for the entire set of time slots scheduled for this combination of task scheduling options. Store the value of '0' in this counter.
- (5) A value indicating the ratio of the number of time slots scheduled to the total calendar time slots required to schedule them (including interruptions, scheduling time not available and time slots scheduled for tasks not in this iteration of FN1, etc.).
- (6) A value indicating the number of P177 list entry groups in this combination of task scheduling options which have tasks scheduled in such a way that the calendar time for scheduling tasks is more than twice the time in which tasks are scheduled.
- (7a)-(7j) Ten counters representing the numbers of various types of tasks that will need to be rescheduled should this task scheduling option be chosen. See the P525a through P525j counters.

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The entries on the P516 list consist of the 3-part labels for task scheduling options given in the P528, P529 or P530 lists.

P517: Start a list, called the P517 list. This will be an exact replica of the P516 list, except, while the P516 list is the combination of task scheduling options as the combination is being formed, the P517 list will be the best combination of task scheduling options, formed thus far in the search for combinations of task scheduling options.

P518: Start a list, called the P518 list. This list will contain information about the combination of task scheduling options being formed in the P516 list that are scheduled for each group of calendar time slots identified by a P177 list entry group. There is an entry on the P518 list for each P177 list entry group, i.e., the number of entries on the list is equal to the value in P233. Each entry on the P518 list consists of 8 data elements:

- (1) A sequential counter ('1' to 'X', where 'X' is the value from P233) equal to the value in data element (1) of the corresponding P177 list entry.
- (2) The number of time slots in this P177 list entry group, i.e., the value in data element (4) of the P177 list entry identified in data element (1) above.
- (3a)-(3d) The number of tasks scheduled in this P177 list entry group for the current combination of task scheduling options. Data elements (3a), (3b), (3c) and (3d) are the counts for currently being scheduled, already scheduled, future scheduled and total scheduled tasks respectively.
- (4a)-(4d) The same as (3a) through (3d), except that this is a count of the number of time slots scheduled rather than tasks scheduled.
- (5) Whether the first time slot of the P177 list entry group identified by data element (1) above is filled as a part of one of the task scheduling options in the current combination of task scheduling options. Answers: Yes/or blank, where a blank means 'No'. (Note: The answer to this question must be 'Yes' for this to be a valid combination of task scheduling options. This is because, although, in attempting to schedule 'employee transport' tasks next to other already

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scheduled 'employee transport' tasks for the same employee, it is acceptable to reschedule the already scheduled tasks (if the schedule for these tasks was not specified by the user and if this rescheduling will be to a better combination of scheduling options); nevertheless, one of the tasks being scheduled in this iteration of FN1 must be scheduled to begin when the already scheduled task was previously scheduled to begin, so that the employee who has been notified of the already scheduled tasks on a Scheduling Notice (015) begins a task at the same time as before the new tasks were scheduled and the already scheduled tasks were rescheduled. This enables the employee to begin to participate in tasks at the same time that the employee has been notified that his participation in tasks will begin.)

- (6) The latest time slot scheduled in this P177 list entry group. In this case, the time slot is identified only by the sequential number assigned to each of the time slots in the P177 list group (i.e., the number assigned to data element (1) of each P349 list entry for this P177 list entry group), because the rest of the information about the time slot is known from other lists. This information is used to measure whether the combination of task scheduling options has tasks scheduled in a P177 list group in such a way that they are so spread out that there is more than twice the distance between tasks as there are time slots required for scheduling the tasks. If this is found to be true, then the combination of task scheduling options is not valid, because it would lead to too much loss of productive time by the employee who is to participate in the task.
- (7) The information needed to determine if the employee in the employee transport tasks in this iteration of FN1 has been, by the current combination of task scheduling options, scheduled for tasks that last more than 4-1/2 hours or more (18 time slots) without a break. This type of combination of task scheduling options would be found not to be valid because the employee could not be expected to be participating in tasks for this length of time without a break. Whether this overly extended scheduling of an employee has occurred is determined by checking the P349 list for a given P177 list entry group for continuous tentatively scheduled time slots (i.e., checking data element (7) on each entry of the P349 list corresponding to

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the P177 list entry group), if the value in data element (4d) of the P518 list entry for the corresponding P177 list entry group exceeds '17'. However, to check whether the total continuous scheduling of an employee exceeds 17 time slots when tasks are scheduled for calendar time slots represented by different P177 list groups, it is necessary to first determine if the P177 list entry groups are continuous (i.e., the calendar time slot where one group begins is immediately after the time slot where the previous group ended) and, if so, to add together the continuously scheduled time slots at the end of the first P177 list entry group to the continuously scheduled time slots at the beginning of the next P177 list entry group.

If more than '17 time slots have been scheduled continuously, the program inserts extra 'interruptions' (i.e., the code of 'I' indicating that this time slot cannot be scheduled!) after (and/or before) the continuous string of tentatively scheduled time slots. The information in data elements (7a) through (7d) of the P518 list entries corresponding to the first and second P177 list entry groups enables the determination to be made of whether the extra interruption time slots need to be inserted and, if so, whether this has already been done. Data element (7e) indicates whether more than 17 time slots on the single P349 list corresponding to this P518 have been previously found to have been tentatively scheduled and interruptions have already been added. Data elements (7c) through (7e) avoid requiring the program to attempt to insert the extra interruption flag more than once.

- (a) Whether the start time slot information in data element (2) for the P177 list entry group represented by this entry on the P518 list begins immediately after the end time slot for the previous P177 list entry group (i.e., the previous P518 list entry) as shown in data element (3), of that P177 list entry.  
Answers: Yes/No
- (b) Whether the end time slot of the P177 list entry represented by this entry on the P518 list (as shown in data element (3) of the P177 list entry) ends immediately before the start time slot (shown in data element (2)) of the next P177/P518 list entry.

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- (c) If (7a) was 'Yes', whether 2 extra 'interruption' flag have been added to the P349 list corresponding to this P518 list indicating that 2 time slot are not to be scheduled, thus ensuring that the combination of the two P349 lists do not result in scheduling more than '17' time slots without a break. Answers: Yes/No
- (d) If (7b) was 'Yes', whether 2 extra interruptions flags have been added. Answers: Yes/No
- (e) Whether 2 extra 'interruption' time slots have been added to address the problem that more than 17 time slots have been continuously scheduled on the P349 list corresponding to this P518 list.
- (f) Whether the calendar time for tentative scheduling of tasks on the P177 list entry group represented by the P518 list entry is more than twice the time for which tasks are scheduled. This data element considers the time between the scheduling of tasks during which the employee would have to wait. Answers: Yes/No

P519: Generate entries for the P518 list. Generate a P518 list entry for each entry on the P177 list. Fill in data elements (1) and (2) on each P518 list entry with the value in data elements (1) and (4) on the corresponding P177 list entry. Set the values in data elements (3a)-(3d), (4a)-(4d), and (6) to be '0'. Leave the remaining data elements on the P518 list entries blank at this time.

P520: Start a counter, called the P520 counter, with the value '0' in it. This counter will be the count of the number of time slots tentatively scheduled for a task as it is tentatively scheduled.

P521: Start a counter, called the P521 counter, with the value of '0' in it. This counter will be the count of the number of time slots tentatively scheduled for a task since the last interruption.

P522: Start a counter, called the P522 counter, with the value of '0' in it. This will be a counter of the number of interruptions in the scheduling of a task as it is tentatively scheduled.

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- P523: Start a counter, called the P523 counter, with the value of '0' in it. This will be a counter of the number of time slots that are interruptions in the scheduling of a task as it is tentatively scheduled.
- P524: Start a counter, called the P524 counter, with the value '0'. This counter will be the count of the number of time slots that are interruptions since the beginning of the last interruption.
- P525: Start a series of 10 counters, called the P525a through P525j counters, each with a value of '0'. These are the counters of the number of tasks having various characteristics that will have to be rescheduled if a task is scheduled in the way it is tentatively scheduled.
- o P525a is the counter for the number of Reminder Notice tasks without standard restrictions that need to be rescheduled if this scheduling option was chosen;
  - o P525b is the recommended tasks without standard restrictions that are undated that would need to be rescheduled;
  - o P525c is the mandatory undated tasks without standard restrictions;
  - o P525d is the Reminder Notice tasks with standard restrictions;
  - o P525e is the recommended undated tasks with standard restrictions;
  - o P525f is the mandatory undated tasks with standard restrictions;
  - o P525g is the recommended dated tasks with standard restrictions;
  - o P525h is the mandatory dated tasks with standard restrictions;
  - o P525i is the total number of dated non-Reminder Notice tasks that would be rescheduled, i.e., the sum of the P525g and P525h; and
  - o P525j is the total number of tasks rescheduled, i.e., the sum of the P525a through P525h counters.

These counts are maintained in order to enable assigning higher priority to scheduling options that require



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rescheduling of the fewest numbers of difficult to reschedule tasks.

P526: Generate the format for a series of lists, called the P526 lists. The P526 lists store the task identifier (ID23) for the tasks that need to be rescheduled if another task is scheduled in the way it is tentatively scheduled. The P526 list has a 3-part label consisting of: part (1) an ID5; part (2) a P177 list entry group number; and, part (3) a code of either 'b' (currently being formed' P526 list, i.e., the P526 list formed while task scheduling options are identified) or 'c' ('best so far' P526 list, i.e., the P526 list corresponding to the best scheduling option for the task). Entries on the P526 list consist of ID23s. These ID23s are put on DL39, if the scheduling option to which the P526 list corresponds is chosen.

P527: Start a counter, called the P527 counter, with the value '0'. This is the counter of the number of time slots scheduled in not the correct time use code (i.e., not the time use code (CT11) preferred by the user for a time slot as specified on the DS26 and DS27 data) if a task is scheduled in the way it is tentatively scheduled.

P528: Generate the format for a series of lists, called the P528 lists. The P528 lists are referred to as task scheduling options lists, because they represent a particular option for scheduling a particular task. The P529 and P530 series of lists are also task scheduling option lists and have the exact same format as the P528 lists. The three types of task scheduling option lists differ in these ways:

- 0 The P528 lists consist of the one scheduling option for each 'already scheduled' task that is an exact copy of the way in which this already scheduled task was previously scheduled;
- 0 The P529 lists consist of all other scheduling options as the options are being formed; and,
- 0 The P530 lists consist of the scheduling options for all tasks in a combination of task scheduling options for the combination that has been found to be the best combination of task scheduling options so far in the search for combinations of task scheduling options (as shown on the P517 list).

The generation and retention of information on these 3 types of task scheduling option lists is as follows:

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- 0 There must be one, and only one, P528 list for each 'already scheduled' task in this iteration of FN1 (i.e., each task on the P26 list);
- 0 The P528 lists are retained throughout FN1;
- 0 The P529 lists are erased after it is determined that a new P529 list should be generated (i.e., there is a code of 'NC' (No Change) in data element (9) of the P492 list entry for the task);
- 0 The P528 and P529 lists may be copied over onto the P530 lists, if it is determined that the combination of task scheduling options shown on the current P529 lists (or combination of P529 and P528 lists; a given combination of task scheduling options can consist of a P529 or a P528 list for each task in the combination) are better than the current combination of task scheduling options shown on the current P530 list;
- 0 The P530 lists are retained throughout FN1 or until a better combination of task scheduling options are found;
- 0 There may be one P529 and/or a P530 list for each task in this iteration of FN1, i.e., each task on the R2 list from P1 (or, put another way, each task on the P7 list). However, only 'already scheduled' tasks must have a P529 and P530 list; 'currently being scheduled' and 'future scheduled' tasks will have P529 lists only if it is possible to identify a scheduling option for the task and, at any point in time, will have a P530 list only if the task was scheduled in the best combination of task scheduling options found at that point in time.

Each P528, P529 and P530 list has a 3 part label: Part (1) is the requirement application identifier (ID5) identifying the task for which this is the scheduling option. Part (2) consists of the P177 list entry group number from which this option was drawn. Part (3) consists of a code indicating whether this is a P528 list (code 'a'), a P529 list (code 'b'), or a P530 list (code 'c').

Each P528, P529 and P530 list contains 13 data elements at the top of the list (before the entries begin):

- (1) A code (1-3) indicating that this is a currently being scheduled, already scheduled or future scheduled task

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- (2)-(4) The value in the P520, P522 and P523 counters as of the last time slot scheduled for the task
- (5a)-(5j) The value in the P525a through P525j counters as of the last time slots scheduled for the task
- (6) The value in the P527 counter as of the last time slot scheduled
- (7) Whether this task scheduling option was scheduled on a DS27 data set that is for one of the ID27s (or pairs of ID27s) that are used for the already scheduled tasks in this iteration of FN1.
- (8) The employee identifier (ID4) for the user scheduled to perform this task
- (9) The time use code (CT11) for the task
- (10) The task type code (CT8) for the task
- (11) Whether this task has any restrictions and, if so, whether they are standard, special or both type of restrictions
- (12) The number of time slots required to schedule this task
- (13) The task identifier (ID23) for this task

Each P528, P529 and P530 list consists of 'X' number of entries, where 'X' is equal to the number of time slots scheduled for the task in this task scheduling option. (Note: 'X' is the value in the P520 counter at the end of the scheduling of the task; because an extra time slot is added to the time slots required to schedule a task for each interruption in the scheduling of the task, the value in the P529 counter will not always be the same as the number of time slots required to schedule the task and will, therefore, not always be the same even for the same task.)

Each entry on the P528, P529 or P530 list will consist of 8 data elements about a time slot:

- (1) A sequential number of the time slot. (Note: This is not the same as the time slot number (1-96); instead, it is a sequential number derived by numbering the time slots of a P177 list entry group beginning with a '1' for the first time slot in the P177 list entry group and ending with the number in P505 for the last time slot in the P177 list entry

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group. This sequential number is derived from data element (1) of each entry on the P361 list.)

- (2) Time slot information. In this case, time slot information consists of three parts: (1) a monthly schedule identifier (ID27), (2) a date (1-31), and (3) a time slot number (1-96).
- (3)-(7) The values from the P520 through P524 counters as of the tentative scheduling of this time slot.
- (8) Whether this time slot was scheduled for the preferred time use (CT11) specified by the user.  
Answers: Yes/No.

P529: Generate a list format for the lists called the P529 lists. These lists are an exact replica of the P528 lists, except that they will be used for entering scheduling option information as the scheduling options are being formed.

P530: Generate a list format for the lists called the P530 lists. These lists are an exact replica of the P528 lists, except that they will be used to enter the best scheduling options identified at any point in the search for scheduling options.

FN1.21: FOR each task identifier (ID23) on the P26 (already scheduled tasks) list:

P531: Identify the entry on the R2 list from P1 that contains the ID23 for this iteration of FN1.21 in data element (1).

P532: Identify the requirement application identifier (ID5) in data element (3) of the R2 list entry from P531.

P533: Begin to generate a P528 list for this task. Fill in part (1) of the label with the ID5 from P532. Fill in part (2) with the P177 list entry group that is data element (2) on the P26 list entry for this iteration of FN1.21 (as expanded in P175). Fill in part (3) with the code 'a'. Fill in the following data elements at the top of the P528 list: Data element (1) is the code '2'. Fill in all of the 8 counters from P525 that are in data element (5) at the top of the P528 list with a '0'. The answer in data element (7) is 'Yes'. Data elements (9), (10), (11) and (12) should be the value in data elements (7), (6), (4b) and (9) of the R2 list entry from P531. Fill in data element (13) of the data elements at the top of the P528 list with the ID23 for this iteration of FN1.21.

P534: Identify the value in data element (11) (task performer group) of the R2 list entry from P531.

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P535: Locate the P476 list with the value from P534 as its label.

FN1.21.1: FOR each entry on the P476 list located in P535:

P536: Identify the employee identifier (ID4) in data element (1) of the P476 list entry for this iteration of FN1.21.1. Place this in data element (8) on the newly generated P528 list for this iteration of FN1.21 (as started in P533).

P537: Identify the first monthly schedule identifier (ID27) in data element (2) of the P476 list entry for this iteration of FN1.21.1.

P538: Identify the second ID27 in data element (3) of the P476 list entry for this iteration of FN1.21.1.

P539: Locate the P361 list with the label consisting of the value from data element (2) of the P26 list entry for this iteration of FN1.20.1 (part (1)) and the ID5 from P532 (part (2)).

P540: Identify the value in data element (4) (number of time slots in the P177 list entry group described by the P361 list) of the 4 data elements at the top of the P361 list located in P539.

P541: Identify the start time slot information in data element (10a) of the R2 list entry located in P531.

P542: Identify the end time slot information in data element (10b) of the R2 list entry located in P531.

P543: Is the ID27 that is part (1) of the P541 time slot information the same as the ID27 from P537? Yes = P544; No = P571 (next FN1.21.1)

P544: Is the ID27 that is part (2) of the P542 time slot information the same as the ID27 from P537? Yes = P545; No = P571 (next FN1.21.1)

P545: Identify the first entry on the P361 list located in P539.

P546: Start a counter, called the P546 counter. Fill the counter with the value in data element (4) (day of the month) of the time slot information on the first P361 list entry (as located in P545).

P547: Start a counter, called the P547 counter. Fill the counter with the value in data element (5) (time slot

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number) of the time slot information on the P361 list entry from P545.

P548: Generate a flag, called the P548 flag. Store the value of '1' in the P548 flag, thereby indicating that FN1.21.1.1 should use the first DS27 data (i.e., the DS27 data corresponding to the ID27 from P537), not the second DS27 data (identified in P538).

FN1.21.1.1: FOR each entry on the P361 list located in P539:

P549: Is the P548 flag a '1' or a '2'? Yes = P550; No = P552

P550: Locate the DS27 data corresponding to the ID27 identified in P537.

P551: GO TO P552.

P552: Locate the DS27 data corresponding to the ID27 identified in P538.

P553: Locate the time slot on the DS27 data for this iteration of FN1.20.1.1 (i.e., the DS27 data from P550 or P552) that is for the day of the month with the value in the P546 counter and the time slot number with the value in the P547 counter.

P554: Is the time slot from P553 already scheduled with a task having the task identifier (ID23) for this iteration of FN1.21? Yes = P561; No = P555

P555: Does the P520 counter (time slots tentatively scheduled) contain a value greater than '0'? Yes (i.e., the time slot in this iteration of FN1.21.1.1 is an interruption of the scheduling of the already scheduled task in this iteration of FN1.21) = P556; No (i.e., the beginning of the scheduling of this already scheduled task has not yet been reached) = P567 (next FN1.21.1.1)

P556: Set the P521 counter (number of time slots scheduled since the last interruption) to be '0'.

P557: Is the value in the P524 counter (number of time slots that are interruptions since the start of the last interruption) equal to '0'? Yes = P558; No = P559

P558: Add '1' to the P522 counter (number of interruptions).

P559: Add '1' to the P524 counter and to the P523 counter (number of time slots that are interruptions).

P560: GO TO P567 (next FN1.22.1.1).

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- P561: Add '1' to the P520 counter (time slots tentatively scheduled) and the P521 counter (time slots tentatively scheduled since the last interruption).
- P562: Set the P524 counter (number of time slots that are interruptions since the beginning of the last interruption) to be '0'.
- P563: Using the DS27 data for this iteration of FN1.21.1.1, compare the preferred time use code (CT11) and the actual time use code (CT11) for this task (as entered in data element (9) of the P528 list generated in this iteration of FN1.21) for the time slot in this iteration of FN1.21.1.1. Are they the same? Yes = P565; No = P564
- P564: Add '1' to the P527 counter (number of time slots with incorrect time use codes).
- P565: Add an entry to the P528 list generated in this iteration of FN1.21 (started in P533). Fill in data element (1) of the new P528 list entry with the value in data element (1) of the P361 list entry for this iteration of FN1.21.1.1. Fill in data element (2) (time slot information) with the ID27 for this iteration of FN1.21.1.1 (part (1)) and the date (part (2)) and time slot number (part (3)) in data elements (4) and (5), respectively, of the P361 list entry for this iteration of FN1.21.1.1. Fill in data elements (3) through (7) with the values in the P520 through P524 counters. Fill in data element (8) with the answer given in P563.
- P566: Add '1' time slot to the P546 and the P547 counters, and, if applicable, change the flag in P548. To do this follow the Processing Substeps (PS) given in P472 with the following exceptions:
- o The P457 counter and the P456 counter should be the P547 and the P546 counters respectively.
  - o P473 should be P567.
  - o PS5 should read: "Identify the value in data element (2) (year) and data element (3) (month) of the P361 list entry for this iteration of FN1.21.1.1."
  - o The P458 flag should be the P548 flag.
- P567: NEXT FN1.21.1.1; end of FN1.21.1.1, GO TO P568.
- P568: Complete data elements (2), (3), (4) and (6) at the top of the newly generated P528 list for this iteration of

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FN1.21 (started in P533) with the current values in the P520, P522, P523 and P527 counters, respectively.

P569: Set the value in the P520 through P525 and P527 counters to '0'.

P570: NEXT FN1.21; end of FN1.21, GO TO FN1.22 (P571).

FN1.22: FOR each entry on the P518 list (the list of information about P177 list entry groups for a combination of task scheduling options):

P571: Identify the P177 list entry group number in data element (1) of the P518 list entry for this iteration of FN1.22.

P572: Is there a P177 list entry with the value in P571 in data element (1)? Yes = P573; No = P602 (next FN1.22)

P573: Locate the P177 list entry with the number in P571 in data element (1).

P574: Is the P518 list entry for this iteration of FN1.22, the first entry on the P518 list? Yes = P575; No = P577

P575: Place the answer 'No' in data element (7a) of the P518 list entry for this iteration of FN1.22.

P576: GO TO P588.

P577: Start a counter with the value '1'.

P578: Derive the value that is equal to the value identified in P571 minus the value in the P577 counter.

P579: Is there a P177 list entry with the value derived in P578 as its data element (1)? Yes = P582; No = P580

P580: Add '1' to the P577 counter.

P581: GO TO P578.

P582: Locate the P177 list entry with the value derived in P578 as its data element (1).

P583: Identify the end time slot information in data element (3) of the P177 list entry located in P582.

P584: Identify the start time slot information in data element (2) of the P177 list entry located in P573.

P585: Identify the time slot that is derived by subtracting '1' time slot from the time slot information in P584. To do



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this follow the Processing Substeps (PS) given in P226, except:

- o P226 should be P585.
- o P212 should be P584.
- o P227 should be P586.

P586: Is the time slot derived in P585 equal to the time slot identified in P583? Yes = P575; No = P587

P587: Place the answer 'Yes' in data element (7a) of the P518 list entry for this iteration of FN1.22.

P588: Is the P518 list entry for this iteration of FN1.22 the last entry on the P518 list? Yes = P589; No = P591

P589: Place the answer 'No' in data element (7b) of the P581 list entry for this iteration of FN1.22.

P590: GO TO P602 (next FN1.22).

P591: Start a counter with the value '1'.

P592: Derive the value that is equal to the value identified in P571 plus the value in the P591 counter.

P593: Is there a P177 list entry with the value derived in P592 as its data element (1)? Yes = P596; No = P594

P594: Add '1' to the P591 counter.

P595: GO TO P592.

P596: Locate the P177 list entry with the value derived in P592 as its data element (1).

P597: Identify the start time slot information in data element (2) of the P177 list entry located in P596.

P598: Locate the end time slot information in data element (2) of the P177 list entry located in P573.

P599: Identify the time slot that is derived by subtracting one time slot from the time slot information in P597. To do this follow the Processing Steps (PS) in P226, except:

- o P226 should be P599.
- o P212 should be P597.
- o P227 should be P600.

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- P600: Is the time slot derived in P599 equal to the time slot identified in P573? Yes = P601; No = P589
- P601: Place the answer 'Yes' in data element (7b) of the P518 list entry for this iteration of FN1.22.
- P602: NEXT FN1.22; end of FN1.22, GO TO FN1.23 (P603).
- FN1.23: FOR each entry on the P492 list, i.e., for each task in this iteration of FN1:
- P603: Identify the ID5 in data element (1) of the P492 list entry for this iteration of FN1.23.
- P604: Identify the code (1-3) in data element (2) of the P492 list entry for this iteration of FN1.23. Store the answer throughout FN1.23.
- P605: Is the code in data element (9a) of the P492 list entry for this iteration of FN1.23 a 'B' (Beginning), 'M' (Marker) or 'NC' (No Change)? B = P655; M = P655; NC = P606
- P606: Determine what list (P528 or P529) to use in this iteration of FN1.23. Identify the code in data element (9b) of the P492 list entry for this iteration of FN1.23. If it is a 'a', use the P528 list. If it is a 'b', use the P529 list. Store this answer throughout FN1.23.
- P607: Locate the P528 list (if the P606 code was 'a') or P529 list (if the P606 code was 'b') with the ID5 from P603 as the first part of its label. Also, if the code in P604 was a '2' (already scheduled task) and the answer in P606 was 'b' (locate the P529 list also), locate the P528 list corresponding to this P529 list and compare the two lists. If the entries on the lists are exactly the same, GO TO P614; otherwise continue.
- P608: Identify the P177 list entry group number in part (2) of the label of the P528/P529 list located in P607.
- P609: Locate the P349 list for the P177 list entry group number located in P608. Also locate the P518 list entry with the P177 list entry group number from P608 in data element (1).
- P610: Add an entry to the P516 list. This entry consists of the 3 parts of the label of the P528/P529 list located in P607, i.e., the ID5 from P603, the P177 list entry group number from P608 and the code 'a' (P528 list) or the code 'b' (P529 list).

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- P611: Add '1' to the data element (2d) counter at the top of the P516 list. Also add '1' to the data element (2a), (2b) or (2c) counters, depending on whether the P604 was a '1', '2' or '3'.
- P612: Add the value in data element (6) (incorrect time use) at the top of the P528/P529 list from P607 to the data element (4) counter at the top of the P516 list. Also add the value in data elements (5a) through (5j) (numbers of various types of tasks that will need to be rescheduled) at the top of the P528/P529 list from P607 to the data element (7a) through (7j) counters at the top of the P516 list.
- P613: Locate the entry on the P415 list with the P177 list entry group number from P608 in data element (1).
- P614: Identify the monthly schedule identifier (ID27) in data element (2) of the P415 list located in P613.
- P615: Identify the ID27 in data element (3) of the P415 list located in P613.
- P616: Is the pair of ID27s identified in P614 and P615 already on the P515 list? Yes = P619; No = P617
- P617: Enter the pair of ID27s from P614 and P615 onto the P515 list.
- P618: Add '1' to the counter in data element (1) at the top of the P516 list.
- P619: Add '1' to data element (3d) counter on the P518 list entry located in P609. Also add '1' to the data element (3a), (3b) or (3c) counters, depending on the P604 code (1-3).
- P620: Identify the value in data element (2) (time slots tentatively scheduled) at the top of the P528/P529 list located in P607.
- P621: Add the value from P620 to data element (4d) counter on the P518 list entry located in P609. Also add the value from P620 to the (4a), (4b) or (4c) counters, depending on the P604 code.
- P622: Locate the first entry on the P528/P529 list from P607.
- P623: Identify the value in data element (1) (P349 list entry number) of the P528/P529 list entry located in P622. Is this value a '1'? Yes (i.e., the scheduling option for the task in this iteration of Fw1.23 begins on the first

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time slot of the P177 list entry group to which the scheduling option belongs) = P624; No = P625

P624: Fill in data element (5) of the P518 list entry located in P609 with the answer 'Yes'.

P625: Locate the last entry on the P528/P529 list from P607.

P626: Identify the value in data element (1) of the P528/P529 list entry located in P625.

P627: Identify the value in data element (6) of the P518 list entry from P609.

P628: Is the value identified in P626 greater than the value identified in P627? Yes = P629; No = P630

P629: Replace the value in data element (6) of the P518 list entry from P609 with the value identified in P626.

FN1.23.1: FOR each entry on the P528/P529 list located in P607:

P630: Locate the value in data element (1) (sequential time slot number) on the P528/P529 list entry for this iteration of FN1.23.1.

P631: locate the entry on the P349 list located in P609 that has the same value in data element (1) as the value identified in P630.

P632: Place a flag of 'S' (indicating that the time slot is tentatively scheduled) in data element (7) on the P349 list entry located in P631.

P633: NEXT FN1.23.1; end of FN1.23.1, GO TO P786.

P634: Is the flag in P491 an 'A' or a 'B'? A = P858 (next FN1.23); B = P635

P635: Is the value in the data element (3b) counter at the top of the P516 list greater than '0'? Yes (i.e., it was not possible to schedule one of the 'already scheduled' tasks using this combination of task scheduling options; therefore, this is not an acceptable scheduling option) = P637; No = P636

P636: Is the value in the data element (3a) counter at the top of the P516 list greater than the value in the data element (3a) counter at the top of the P517 list? Yes (i.e., even though this combination of task scheduling options has not been completed, it is already known that more 'currently being scheduled' tasks will not be scheduled with this combination of task scheduling options

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than with the current best scheduling option identified so far; therefore, this scheduling option is abandoned) = P637; No = P858 (next FN1.23)

P637: Erase all of the values in the current P516 list (i.e., the current combination of task scheduling options), including the values in the data elements at the top of the list. However, keep the blank format for the P516 list. Also erase the value in data element (7) for all entries on all P349 lists. Also erase the values for data elements (3) through (7) on all entries on the P516 list.

P638: Identify the value in data element (6) (number of P492 list entries) on the last entry on the P492 list.

P639: Store a counter, called the P639 counter, with the value from P638.

P640: Locate the P492 list entry with the value in data element (6) equal to the value in the P639 counter.

P641: Is the answer in data element (10) of the P492 list entry located in P640 a 'Yes' or 'No'? Yes (i.e., there is only one scheduling option for the task in this iteration of FN1.23; therefore, do not reset the P492 list entries) = P644; No = P642

P642: Is the P639 counter equal to the value from P638? Yes (i.e., the P492 list entry located in P640 is the last entry on the P492 list) = P643; No = P646

P643: Reset the value in the P492 list entry from P640: Data elements (1), (2), (4), (6), and (10) remain unchanged. Set the flag in data element (3) of the P492 list entry located in P492 to be a '1'. Set the counter in data elements (5) and (7) (point the P476 list and the P361 list where the program logic left off in the last search for scheduling options) to be a '1'. Set data element (8) (whether a search for scheduling options for this task has reached an end) to be 'No'. Set data element (9a) to be 'B' (i.e., start next search for scheduling options from the beginning). Also identify the P529 list with the ID5 that is data element (1) of the P492 list entry from P640 in part (1) of its label. Erase this P529 list. Also identify the P526 list with the ID5 that is data element (1) of the P492 list entry from P640 in part (1) of its label and the code 'b' (currently being formed) as part (3) of its label. Erase this P526 list.

P644: Subtract '1' from the P639 counter.

P645: GO TO P640.

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- P646: Is the P639 counter equal to '0'? Yes = FN1.23 (i.e., begin the FN1.23 iterations over again starting with the first task on the P492 list); No = P647
- P647: Is there a P651 flag? Yes = P653; No = P648
- P648: Is the answer in data element (8) (whether the program reached an end for search for scheduling options for this task) in the P492 list entry located in P640 a 'Yes' or a 'No'? Yes = P649; No = P650
- P649: Is the value in the P639 counter a '1'? Yes (i.e., this is the first entry on the P492 list and the program has reached an end in the search for scheduling options for the task on this P492 list entry; therefore, the search for scheduling options is completed) = P902; No = P643
- P650: Reset the values in the P492 list entry from P640: All data elements except data elements (7) and (9) remain unchanged. Add '1' to the value in the data element (7) counter (point on the P361 list where the program logic left off at the end of the last search for scheduling options). Change the value in data element (9a) to read 'M' (start next search for scheduling options from the data element (7) Marker). Also identify the P529 list with the ID5 that is data element (1) of the P492 list entry from P640 in part (1) of its label. Erase this P549 list. Also identify the P526 list with the ID5 that is data element (1) of the P492 list entry from P640 in part (1) of its label and code 'b' as part (3) of its label. Erase this P526 list.
- P651: Set a flag, called the P651 flag. This flag indicates that one task has been found at which the search for scheduling options will begin at the point after the previous search, i.e., from the marker. Therefore, all tasks higher on the P492 list than the task in the P492 list entry corresponding to the current value of the P639 counter will remain unchanged.
- P652: GO TO P644.
- P653: Reset the values in the P492 list entry from P640: All data elements except data elements (9a) and (9b) remain unchanged. Change the code in data element (9a) to be 'NC' (no change from the previous scheduling option). Fill data element (9b) with the code 'b' (use the P29 list for the task scheduling option for the task in the P492 list entry corresponding to the current value in the P639 counter).

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- P654: GO TO P644.
- P655: (From P605): Identify the entry on the R2 list from P1 that contains the ID5 identified in P603.
- P656: Identify the value in data element (11) (task performer group) of the R2 list entry from P655.
- P657: Locate the P476 list with the value identified in P656 as its label.
- P658: Identify the value in data element (5) (point on the P476 list at which this search for scheduling options should begin) of the P492 list entry for this iteration of FN1.23.
- P659: Identify the value in data element (7) (point on the P361 list at which this search for scheduling options should begin).
- FN1.23.2: FOR each entry on the P476 list located in P657 beginning with the P476 list entry that has the value from P658 in data element (7) of the entry (i.e., the data element containing the sequential count of P476 list entries):
- P660: Identify the value in data element (6) (P177 list entry group number) of the P476 list entry for this iteration of FN1.23.2.
- P661: Locate the P361 list with the label consisting of the value from P660 (part (1)) and the ID5 from P603 (part (2)).
- P662: Is there a value (answers of 'Yes' or 'No') in data element (5) (whether it is possible to use the scheduling option in this entry of the P361 list) of the data elements at the top of the P361 list entry located in P661? Yes = P663; No = P664
- P663: Is the answer in data element (5) of the data elements at the top of the P361 list entry located in P661 a 'Yes' or a 'No'? Yes = P673; No = P676
- P664: Identify the value in data element (2) (number of restricted time slots) at the top of the P361 list from P661.
- P665: Identify the value in data element (3) (number of time slots required to schedule the task) at the top of the P361 list from P661.

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- P666: Identify the value in data element (4) (number of time slots on the P361 list) (i.e., time slots in the P177 list entry group represented by this list) at the top of the P361 list from P661.
- P667: Derive the sum that is equal to the value from P664 plus the value from P665. Is this value greater than the value in P666? Yes (i.e., there are not enough time slots on this P361 list to schedule the task in this iteration of FN1.23) = P668; No = P670
- P668: Fill data element (5) (whether it is possible to schedule the task with this scheduling option) at the top of the P361 list located in P661 with the answer 'No'.
- P669: GO TO P676.
- P670: Identify the value in data element (5) (number of time slots not available for scheduling) of the P476 list entry for this iteration of FN1.23.2.
- P671: Derive the sum of the value from P665 and the value from P670. Is this value greater than the value in P666? Yes = P668; No = P672
- P672: Fill data element (5) at the top of the P361 list located in P661 with the answer 'Yes'.
- P673: Is the value identified in P659 (i.e., the value in the counter in data element (7) (point on the P361 list at which this search for scheduling options should begin) of the P492 list entry for this iteration of FN1.23) greater than the value from P666 (i.e., the number of time slots on this P361 list)? Yes (i.e., in the last search the program reached the last entry on the P361 list identified in P661 and, therefore, when the P492 list entry values were reset in P650, the marker was set beyond the end of this P361 list) = P676; No = P674
- P674: Derive the value that is equal to the value from P666 (total time slots on this P361 list) minus the value from P659 (the point on the P361 list where the program will begin its search for scheduling options) plus '1'. This value is the number of time slots left on the P361 list at this point in the scheduling of options.
- P675: Is the value from P665 (time slots required to schedule this task) greater than the value derived in P674? Yes = P676; No = P696
- P676: Erase the current values in the P529 list (if any). Do not erase the P529 list format, however. Also erase the P526 list (if any) with the ID5 from P603 as part (1) of



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its label and the code 'b' (currently being formed) in part (3) of its label.

- P677: Set the value in the P520 through P525 counters and the P527 counter to be '0'.
- P678: Identify the value in data element (4) (number of entries on the P476 list) of the P492 list entry for this iteration of FN1.23.
- P679: Is the value from P678 equal to the value from P658 (point on the P476 list at which this search for scheduling options is now located)? Yes (i.e., the search for scheduling options has reached the end of the P476 list for the current flag in data element (3) of the P492 list entry for this iteration of FN1.23) = P683; No = P680
- P680: Add '1' to the value in data element (5) (point on the P476 list where this program search for scheduling options is located) of the P492 list entry for this iteration of FN1.23.
- P681: Set the value in data element (7) (point on the P361 list where the search for scheduling options is located) of the P492 list entry for this iteration of FN1.23 to be '1'.
- P682: GO TO P857 (next FN1.23.2).
- P683: Is the code in P604 a '1' (currently being scheduled task)? Yes = P684; No = P687
- P684: Is the flag in data element (3) of the P492 list entry for this iteration of FN1.23 equal to '11'? Yes = P693; No = P685
- P685: Add '1' to the flag in data element (3) of the P492 list entry for this iteration of FN1.23.
- P686: Set the value in data elements (5) and (7) on the P492 list entry for this iteration of FN1.23 to be '1'. GO TO P658.
- P687: Is the flag in data element (3) of the P492 list entry for this iteration of FN1.23 equal to '3'? Yes = P688; No = P685.
- P688: Is the code (1-3) identified in P604 a '2' or a '3'? 2 = P689; 3 = P691
- P689: Add '1' to data elements (3b) and (3d) at the top of the P516 list.
- P690: GO TO P604.

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- P691: Add '1' to data elements (3c) and (3d) at the top of the P516 list.
- P692: GO TO P694.
- P693: Add '1' to data elements (3a) and (3d) at the top of the P516 list.
- P694: Place the answer 'Yes' in data element (8) (whether this task has reached an end to scheduling options) of the P492 list entry for this iteration of FN1.23.
- P695. GO TO P634.
- P696: Locate the P349 list with the value from P660 (the P177 list entry group number) as its label.
- P697: Locate the P455 list with the value from P660 as the first part of its label.
- P698: Locate the P518 list entry with the value from P660 as its data element (1).
- P699: Obtain the answer (Yes/No) in data element (4) (whether this scheduling option is one of the ID27s used for the 'already scheduled' tasks) of the P476 list entry for this iteration of FN1.23.2.
- P700: Obtain the value in data element (7) (identifying the entry on the P476 list) of the P476 list entry for this iteration of FN1.23.2.
- P701: Begin to generate a P529 list for the task in this iteration of FN1.23. (Erase any existing P529 list for this task; erase any ID23 stored in P526; set the P520 through P525 and P527 counters at '0'.) Fill in part (1) of the label of the new P529 list with the ID5 from P603. Fill in part (2) with the P177 list entry group number from P660. Fill in part (3) with the code 'b'. Fill in the following data elements at the top of the P529 list: Data element (1) is the code from P604. Fill in all counters from P525 that are in data elements (2) through (6) at the top of the P529 list with a '0'. The answer in data element (7) is the answer obtained from P699. Data elements (9), (10), (11) and (12) should be the value in data elements (7), (6), (4b) and (9) of the R2 list entry from P655. Fill in data element (13) of the data elements at the top of the P529 list with the ID23 in data element (1) on the R2 list entry from P655, if there is an entry in data element (1) (otherwise, leave data element (13) on the top of the P529 list blank). Also generate a new P526 list for the task in this iteration of

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FN1.23. (Erase the existing P526 lists (if there is one) for this task that have the code of 'b' in part (3) of its label.) Fill in the label for this new P526 list with the same label as the P529 list g in this substep.

P702: Identify the employee identifier (ID4) in data element (1) of the P476 list entry for this iteration of FN1.23.2. Place this in data element (8) on the newly generated P529 list for this iteration of FN1.23 (as started in P701).

P703: Identify the first monthly schedule identifier (ID27) in data element (2) of the P476 list entry for this iteration of FN1.23.2.

P704: Identify the second ID27 in data element (3) of the P476 list entry for this iteration of FN1.23.2.

P705: Identify the value in data element (3) (time slots required for the task) at the top of the P361 list from P661.

P706: Identify the value in data element (4) (time slots on the P361 list) at the top of the P361 list from P661.

P707: Locate the entry on the P361 list located in P661 with the value from P659 in data element (1).

P708: Identify and store the month (1-12) that is data element (3) of the P361 list entry located in P705.

FN1.23.2.1: FOR each entry on the P361 list located in P661 starting with the P361 list entry that has the value from P659 in data element (1) (i.e., the value in the data element (4) counter on the P492 list entry for this iteration of FN1.23):

P709: Identify the value that is in data element (1) (sequential time slot counter) of the P361 list entry for this iteration of FN1.23.2.1.

P710: Derive the value that is equal to the value identified in P706 (time slots in the P361 list) minus the value identified in P709, plus '1'. This value is equal to the maximum number of entries (time slots) left on the P361 list for this iteration of FN1.23.2 starting with, and including, the entry for this iteration of FN1.23.2.1.

P711: Derive the value that is equal to the value currently in the P520 counter (time slots tentatively scheduled) minus the value currently in the P522 counter (number of interruptions). This value is equal to the number of time slots that still need to be scheduled for the task in this iteration of FN1.23.

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- P712: Is the value identified in P711 greater than the value derived in P710? Yes = P676; No = P713
- P713: Identify the answer (Yes/No) in data element (7) (whether this time slot is restricted) of the P361 list entry for this iteration of FN1.23.2.1. Is the answer a 'Yes' or a 'No'? Yes = P714; No = P719
- P714: Does the P520 counter (time slots tentatively scheduled) contain a value greater than '0'? Yes (i.e., the time slot in this iteration of FN1.23.2.1 is an interruption of the scheduling of the task in this iteration of FN1.23) = P715; No (i.e., the beginning of the tentative scheduling of this task has not yet been reached) = P717
- P715: Erase the P529 list for this iteration of FN1.23.2 (as started in P701). Also locate the P526 list with the requirement application identifier (ID5) from P603 as the first part of its label and the code 'b' (currently being formed) as the third part of its label. Erase this P526 list.
- P716: Set the P520 through P525 and P527 counters to be '0'.
- P717: Place the value identified in P709 in data element (7) on the P492 list entry for this iteration of FN1.23.
- P718: GO TO P782 (next FN1.23.2.1).
- P719: Locate the entry on the P349 list located in P696 that has the value identified in P709 in data element (1) of the P349 list entry.
- P720: Identify the answer (blank, 'S', 'I') in data element (7) (whether this time slot is tentatively scheduled) on the P349 list entry located in P719. Is this answer a blank (i.e., not tentatively scheduled), an 'S' or an 'I'? blank = P721; S = P714; I = P721
- P721: Locate the entry (time slot) on the P455 list located in P697 with the value from P709 in its data element (1).
- P722: Is there a code ('B' or 'T') (i.e., an indication that this time slot is not available for scheduling) in data element (5) on the P455 list entry located in P721? Yes with a code of 'B' (i.e., this time slot is not available for scheduling because of a break in the employee's time who will perform the tasks on the DS27 data corresponding to this P455 list entry, e.g., a lunch break) = P723; Yes with a code of 'T' (i.e., this time slot is not available for scheduling because other tasks have already been

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scheduled in this time slot and these are tasks that cannot be rescheduled) = P714; No = P732

- P723: Identify the flag in data element (3) on the P492 list entry for this iteration of FN1.23. Is this flag a '1' (i.e., is this search for scheduling options using the first (most rigid) criteria for selection of scheduling options)? Yes = P714; No = P724
- P724: Does the P520 counter (time slots tentatively scheduled) contain a value greater than '0'? Yes = P725; No = P715
- P725: Does the P521 counter (time slots tentatively scheduled since the last interruption) contain the value '0'; '1' or '2'; or 'greater than two'? 0 (i.e., this interruption in the scheduling of the task is a continuation of an interruption that has already started) = P729; 1 or 2 (i.e., there are insufficient numbers of time slots scheduled for this task before the task has an interruption to justify this scheduling option) = P715; greater than 2 = P726
- P726: Derive the value equal to the value from P705 (time slots required for this task) plus the value from the P522 counter (number of interruptions).
- P727: Derive the value that is equal to the value derived in P726 minus the value in the P520 counter (number of time slots tentatively scheduled). Is this value greater than '2'? Yes = P728; No (i.e., there are insufficient numbers of time slots left to schedule in this task to justify an interruption in the scheduling of the task at this point; therefore, this scheduling option is precluded) = P715
- P728: Add '1' to the P522 counter (number of interruptions).
- P729: Add '1' to the P524 counter and add '1' to the P523 counter (number of time slots that are interruptions). Set the value in the P521 counter to be '0'.
- P730: Is the value in the P523 counter (number of time slots that are interruptions) greater than one half of the value from P705 (time slots required to schedule this task)? Yes (i.e., there are too many interruptions on the scheduling of this task to justify this scheduling option) = P715; No = P731
- P731: If the value in the P524 counter is greater than '3', then GO TO P715. If not, enter the value from P709 (the P361 list entry number) onto a list, called the P731 list. This list is maintained in order that the interruptions in the scheduling of this task may be entered onto the P349 list as not being available for scheduling; this is done

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in order to keep these interruptions from being scheduled by other tasks in this iteration of FN1, which is not desirable because it would mean interrupting one task to perform another. Then, if the answer in P724 was 'Yes', GO TO P782 (next FN1.23.2.1). If the answer was 'No', GO TO P717.

- P732: Identify the value in data element (3) (month) of the P361 list entry for this iteration of FN1.23.2.1. Is this value the same as the value from P708? Yes = P733; No = P734
- P733: Locate the DS27 data corresponding to the ID27 identified in P703. GO TO P735.
- P734: Locate the DS27 data corresponding to the ID27 identified in P704.
- P735: Identify the value in data element (4) (day of the month) of the P361 list entry for this iteration of FN1.23.2.1.
- P736: Identify the value in data element (5) (time slot number) of the P361 list entry for this iteration of FN1.23.2.1.
- P737: Locate the time slot on the DS27 data for this iteration of FN1.23.2.1 (i.e., the DS27 data from P732 or from P734) that is for the day of the month with the value from P735 and the time slot number with the value from P736.
- P738: Is the time slot located in P737 already scheduled with a task? (Note: The answer is shown on the DS27 data.) Yes = P739; No = P736
- P739: Is the flag in data element (3) of the P492 list entry for this iteration of FN1.23 greater than '3'? Yes (i.e., the program has reached the point in the search for scheduling options in which the possibility of rescheduling other tasks will be considered in order to schedule all 'employee transport' tasks for the same employee at approximately the same time) = P740; No = P714
- P740: Identify the task identifier (ID23) of the task scheduled in the time slot identified in P737.
- P741: Locate the P526 list with the ID5 from P603 as the first part of its label and the code 'b' (currently being formed list) as the third part of its label.
- P742: Is the task identifier (ID23) from P740 on the P526 list located in P741? Yes (i.e., the program has previously identified time slots scheduled for this task as subject

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to rescheduling, if the tentative scheduling for the task in this iteration of FN1.23 is selected) = P776; No = P743

P743: Determine whether the task currently scheduled in the time slot located in P737 has any standard restrictions?

(Note: This task cannot have any special restrictions, because, if it did, it would have been eliminated in the P722 check). Yes = P744; No = P760 (Note: The answer to this question and the following questions about the nature of the task that is scheduled in the time slot identified in P737 can be obtained using the DS27 data from P732/P734.)

P744: Is the flag in data element (3) of the P492 list entry for this iteration of FN1.23 greater than '6'? Yes = P745; No = P714

P745: Is the time slot identified in P737 scheduled for a task that was initiated based on a requirement or based on Reminder Notice type suspense data? Reminder Notice = P746; requirement = P748

P746: Add '1' to the P525d counter.

P747: GO TO P769.

P748: Is the P737 time slot scheduled with a task that is dated (i.e., has a due date)? Yes = P749; No = P755

P749: Is the flag in data element (3) of the P492 list entry for this iteration of FN1.23 greater than '9'? Yes = P750; No = P714

P750: Is the P737 time slot scheduled with a task that is mandatory or recommended? man = P751; recommended = P753

P751: Add '1' to the P525h and the P525i counters.

P752: GO TO P769.

P753: Add '1' to the P525g and P525i counters.

P754: GO TO P769.

P755: Is the P737 time slot scheduled with a task that is mandatory or recommended? mandatory = P756; recommended = P758

P756: Add '1' to the P525f counter.

P757: GO TO P769.

P758: Add '1' to the P525e counter.

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- P759: GO TO P769.
- P760: Is the P737 time slot scheduled with a task that was initiated based on a requirement or on a Reminder Notice type suspense data? requirement = P763; Reminder Notice = P761
- P761: Add '1' to the P525a counter.
- P762: GO TO P769.
- P763: Is the flag in data element (3) of the P492 list entry for this iteration of FN1.23 greater than '4'? Yes = P764; No = P714
- P764: Is the P737 time slot scheduled with a task that is mandatory or recommended? mandatory = P767; recommended = P765
- P765: Add '1' to the P525b counter.
- P766: GO TO P769.
- P767: Is the flag in data element (3) of the P492 list entry for this iteration of FN1.23 greater than '5'? Yes = P768; No = P714
- P768: Add '1' to the P525c counter.
- P769: Locate the P526 list with the ID5 from P603 as the first part of its label and the code 'b' (currently being formed) as the third part of its label.
- P770: Place the task identifier (ID23) identified in P740 onto the P526 list located in P769.
- P771: Add '1' to the P525j counter.
- P772: Identify the preferred time use code (CT11) given on the DS27 data from P732/P734 for the time slot located in P737.
- P773: Is the time use code (CT11) identified in P772 the same as the time use code in data element (9) on the P529 list for this iteration of FN1.23 (as started in P701)? Yes = P776; No = P774
- P774: Is the flag in data element (3) of the P492 list entry for this iteration of FN1.23 greater than '2'? Yes (i.e., the program is at the point of searching for scheduling options for the task in this iteration of FN1.23 that it will disregard preferred time use codes as the criteria



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for not scheduling a task in a time slot) = P775; No = P714

P775: Add '1' to the P527 counter.

P776: Is the value in the P520 counter (time slots tentatively scheduled) equal to '0'? Yes = P777; No = P778

P777: Place the value identified in P709 into data element (7) (point on the P361 list) of the P492 list entry for this iteration of FN1.23.

P778: Add '1' to the P520 counter (time slots tentatively scheduled) and the P521 counter (time slots tentatively scheduled since the last interruption).

P779: Set the P524 counter (number of time slots that are interruptions since the beginning of the last interruption) to be '0'.

P780: Add an entry to the P529 list generated in this iteration of FN1.23.2 (as started in P701). Fill in data element (1) of the new P529 list entry with the value from P709. Fill in data element (2) (time slot information) with the ID27 for this iteration of FN1.23.2.1 (from P703/P704) (part (1)); the date from P735 (part (2)); and, the time slot number from P736 (part (3)). Fill in data elements (3) through (7) with the values in the P520 through P524 counters. Fill in data element (8) with the answer given in P773.

P781: Derive the sum that is equal to the value from P705 (time slots required for this task) plus the value from the P522 counter (number of interruptions). Is this value equal to the value in the P520 counter (number of time slots tentatively scheduled)? Yes (i.e., a tentative task scheduling option has been identified for the task in this iteration of FN1.23) = P783; No = P782 (next FN1.23.2.1)

P782: NEXT FN1.23.2.1; end of FN1.23.2.1, GO TO P676.

P783: Complete data elements (2) through (6) at the newly generated P529 list for this iteration of FN1.23 (as started in P701) with the current value in the P520 through P525 and P527 counters, respectively.

P784: Set the value in the P520 through P525 and P527 counters to be '0'.

P785: GO TO P607.

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P786: (From P633): Are there any entries on the P731 list (list of time slot numbers for interruptions)? Yes = FN1.23.2.2 (P787); No = P791

FN1.23.2.2: FOR each entry on the P731 list:

P787: Locate the entry on the P349 list from P696 that contains the value of the entry on the P731 list for this iteration of FN1.23.2.2 in data element (1) of the P349 list entry.

P788: Enter a 'I' in data element (7) of the P349 list entry located in P787.

P789: NEXT FN1.23.2.2; end of FN1.23.2.2, GO TO P790.

P790: Erase the P731 list.

P791: Is the value in data element (4d) (number of time slots tentatively scheduled for a given P177 list entry group) in the P518 list entry located in P698 greater than '17'? Yes (i.e., the employee for which the 'employee transport' tasks in this iteration of FN1 are being scheduled has been scheduled to participate in at least 4 1/2 hours of tasks; therefore, a check needs to be made to determine if there are many breaks in the tasks tentatively scheduled as a part of this iteration of FN1 in which this employee will be participating) = P792; No = P810

P792: Is the answer in data element (7e) (whether extra interruptions have been entered) of the P518 entry located in P698 a 'Yes' or 'No'? Yes = P810; No = P793

P793: Start a counter, called the P793 counter with the value '0'.

P794: Start a counter, called the P794 counter with the value '0'.

FN1.23.2.3: FOR each entry on the P349 located in P696:

P795: Identify the value in data element (7) (whether tentatively scheduled) of the P349 list entry for this iteration of FN1.23.2.3.

P796: Is the value from P796 a 'blank', 'S' or a 'I'? Blank = P799; S = P797; I = P807

P797: Add '1' to the P793 counter.

P798: GO TO P808 (next FN1.23.2.3).

P799: Is the P793 counter greater than '17'? Yes = P802; No = P800

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P800: Set the P793 counter to be '0'.

P801: GO TO P808 (next FN1.23.2.3).

P802: Place the value 'I' in data element (7) of the P349 list entry for this iteration of FN1.23.2.3.

P803: Add '1' to the P794 counter.

P804: Is the P794 counter equal to '2'? Yes = P805; No = P808 (next FN1.23.2.3)

P805: Place the answer 'Yes' in data element (7e) of the P518 list entry from P698 thus indicating that extra 'I' (interruptions) entries have already been put onto the P349 list located in P696.

P806: GO TO P810.

P807: Is the P793 counter greater than '17'? Yes = P803; No = P800

P808: NEXT FN1.23.2.3; end of FN1.23.2.3, GO TO P809.

P809: Is the P794 counter greater than '17'? Yes (i.e., there was not sufficient space left on the P349 list to enter extra 'I' codes) = P805; No = P810

P810: Identify the value in data element (4d) (number of time slots scheduled) on the P518 entry from P698.

P811: Identify the answer given in data element (7a) (whether this P177 list entry group continues immediately after a previous group) of the P518 list entry identified in P698.

P812: Is the answer identified in P811 a 'Yes' or a 'No'? Yes = P813; No = P840

P813: Is the answer in data element (7c) (whether extra interruptions have been entered) of the P518 list entry located in P698 a 'Yes' or a 'No'? Yes = P840; No = P814

P814: Identify the value in data element (1) of the P518 list entry from P698.

P815: Store a counter, called the P815 counter, with the value from P814.

P816: Subtract '1' from the P815 counter.

P817: Is there a P518 list entry with the value from the P815 counter in data element (1)? Yes = P818; No = P816

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- P818: Locate the P518 list entry with the value from the P815 counter as its data element (1).
- P819: Identify the value in data element (4d) (number of time slots scheduled) on the P518 list entry located in P818.
- P820: Derive the value equal to the value from P810 plus the value from P819. Is this value equal to greater than '17'? Yes = P821; No = P840
- P821: Locate the P349 list with the value from the P815 counter as its label.
- P822: Locate the value in data element (1) of the last entry on the P349 list located in P821.
- P823: Start a counter, called the P823 counter, with the value from P822.
- P824: Start a counter, called the P824 counter, with the value of '0'.
- P825: Start a counter, called the P825 counter, with the value '0'.
- P826: Locate the P349 list entry with a value in data element (1) equal to the value in the P823 counter.
- P827: Identify the value in data element (7) of the P349 list entry located in P826. Is this value a 'blank', 'S' or a 'I'? blank = P835; S = P828; I = P839
- P828: Add '1' to the P824 counter.
- P829: Is the P823 counter equal to '1'? Yes = P830; No = P833
- P830: Is the P824 counter greater than '17'? Yes = P831; No = P840
- P831: Place the answer 'Yes' in data element (7c) of the P518 list entry located in P698.
- P832: GO TO P840.
- P833: Subtract '1' from the P823 counter.
- P834: GO TO P826.
- P835: Is the P824 counter greater than '17'? Yes = P836; No = P840

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- P836: Place the value 'I' in data element (7) of the P349 list entry located in P826.
- P837: Add '1' to the P825 counter.
- P838: Is the P825 counter equal to '2'? Yes = P840; No = P829
- P839: Is the P824 counter greater than '17'? Yes = P837; No = P840
- P840: Is the answer given in data element (7b) (whether this P177 list entry group is continued immediately after its end by another P177 list entry group) of the P518 list entry identified in P698 a 'Yes' or a 'No'? Yes = P841; No = P856
- P841: Is the answer in data element (7d) (whether extra interruptions have already been entered) of the P518 list entry located in P698 a 'Yes' or a 'No'? Yes = P856; No = P842
- P842: Start a counter, called the P842 counter, with the value of '0'.
- FN1.23.2.4: FOR each entry on the P349 list located in P696:
- P843: Identify the value in data element (7) (whether tentatively already scheduled) of the P349 list entry for this iteration of FN1.23.2.4.
- P844: Is the value from P843 a 'blank', 'S' or a 'I'? blank = P847; S = P845; I = P853
- P845: Add '1' to the P824 counter.
- P846: GO TO P854 (next FN1.23.2.4).
- P847: Is the P824 counter greater than '17'? Yes = P848; No = P856
- P848: Place the value 'I' in data element (7) of the P349 list entry for this iteration of FN1.23.2.4.
- P849: Add '1' to the P842 counter.
- P850: Is the P842 counter equal to '2'? Yes = P851; No = P854 (next FN1.23.2.4)
- P851: Place the answer 'Yes' in data element (7d) of the P518 list entry from P698.
- P852: GO TO P856.

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P853: Is the P824 counter greater than '17'? Yes = P849; No = P856

P854: NEXT FN1.23.2.4; end of FN1.23.2.4, GO TO P855.

P855: Is the P824 counter greater than '17'? Yes = P851; No = P634

P856: GO TO P634.

P857: NEXT FN1.23.2; end of FN1.23.2, GO TO P858.

P858: NEXT FN1.23; end of FN1.23, GO TO P859.

P859: Is the value in data element (2a) (number of currently being scheduled tasks tentatively scheduled in this combination of task scheduling options) at the top of the P516 list equal to '0'? Yes (i.e., this is not an acceptable scheduling option because none of the currently being scheduled tasks were tentatively scheduled in this scheduling option) = P637; No = P860

P860: Start a counter, called the P860 counter, with the value '0'.

P861: Start a counter, called the P861 counter, with the value '0'.

FN1.24: FOR each entry on the P518 list:

P862: Is the answer in data element (5) (whether the first time slot was scheduled) a 'Yes' or a 'No'? Yes = P863; No (i.e., the combination of task scheduling options shown on the current P516 list is not acceptable) = P637

P863: Identify the value in data element (4d) (number of time slots scheduled in this task scheduling option) of the P518 list entry for this iteration of FN1.24.

P864: Identify the value in data element (6) (latest time slot scheduled in this task scheduling option) of the P518 list entry for this iteration of FN1.24.

P865: Add the value from P864 to the P860 counter.

P866: Is the value from P864 more than twice the value from P863, i.e., is the amount of calendar time to schedule the tasks in this combination of task scheduling options, including the amount of time between the tasks scheduled, in this P177 list entry (as portrayed by this

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P518 list entry) greater than twice the amount of time scheduled for the tasks? (Note: We are not concerned here with the total calendar time for all P177 list entry groups (i.e., for all tasks scheduled in this FN1), because each P177 list entry group begins with the time slot in which an 'already scheduled' task was originally scheduled and these first time slots on the P177 list entry groups remain fixed as the point in which groups of employee transport tasks scheduled for the employee in this FN1 will begin. (More than one entry on the P177 list indicates that the program previously it was not possible to schedule one or more of the employee transport tasks for the employee in this iteration of FN1 at approximately the same time as already scheduled employee transport tasks for the same employee.) The program logic has endeavored to schedule all new (currently being scheduled) and future employee transport tasks for the same employee at approximately the same time (i.e., within the same 9 hour period as represented by a P177 list entry group). If, however, the combination of task scheduling options described by the P518 list entry for this iteration of FN1.24 indicates that the tasks have been spread so far apart that the time between tasks scheduled is greater than twice the time for scheduling the tasks, this indicates that this is not an ideal scheduling option.) Yes = P867; No = P870

P867: Add '1' to the P861 counter.

P868: Fill in data element (8) on the P518 list entry for this iteration of FN1.24 with a 'Yes'.

P869: GO TO P871 (next FN1.24).

P870: Fill in data element (8) on the P518 list entry for this iteration of FN1.24 with a 'No'.

P871: NEXT FN1.24, end of FN1.24, GO TO P872.

P872: Place the value from the currently P861 counter onto data element (6) of the data elements at the top of the P516 list.

P873: Divide the value that is equal to the value in the P860 counter divided by the sum of the values from the P2 counter (number of time slots required for unscheduled tasks) and the value from the P4 counter (number of time slots required for already scheduled tasks). This value is the overall ratio (for all P177 list entry groups) of the time slots scheduled versus calendar time slots used to schedule the tasks in this combination of task

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scheduling options, when breaks and time between tasks is considered.

- P874: Place the value from P873 onto data element (5) of the data elements at the top of the P516 list.
- P875: Is the value in the P861 counter equal to '0'? Yes = P876; No (i.e., this is not an ideal combination of task scheduling options and therefore the search for other better combinations of task scheduling options will continue) = P880
- P876: Identify the number of entries on the P7 list (number of tasks in this iteration of FN1).
- P877: Identify the value in data element (2d) (number of tasks scheduled in this combination of task scheduling options) at the top of the P516 list. Is this value equal to the value derived in P876? Yes = P878; No = P880
- P878: Identify the value in data element (3d) (tasks that need to be rescheduled in this combination of task scheduling options) at the top of the P516 list. Is this value '0'? Yes = P879; No (i.e., this is not an ideal combination of task scheduling options) = P880
- P879: Identify the value in data element (4) (number of time slots tentatively scheduled in not the preferred time use code (CT11)). Is this value equal to '0'? Yes (i.e., this is an 'ideal' scheduling option) = P924; No (i.e., this is not an ideal combination of task scheduling options) = P880
- P880: Is the flag in P491 a 'A' or a 'B'? A = P881; B = P886
- P881: Change the P491 flag to a 'B'.
- P882: Copy each of the P528 or P529 lists with a list label as an entry on the current P516 list onto a P530 (i.e., task scheduling option in the best combination of task scheduling options so far) list. To do this, simply copy the P528 or P529 list and change the code in part (3) of the label in the new P530 list to be a 'c'. Do not erase the P528 or P529 lists.
- P883: Copy the P516 list onto a P517 list.
- P884: For each of the P526 lists (tasks needing to be rescheduled if the task scheduling option is chosen) for which the ID5 in part (1) of the P526 label is an entry on the P517 list, change the code in part (3) of the P526 label to be a 'c' (best so far).



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P885: GO TO P637.

P886: Compare the value in data element (2a) (currently being scheduled tasks scheduled in this combination of task scheduling options) in the data elements at the top of the P516 list with the value in data element (2a) at the top of the P517 list. Is the P516 list value equal to, greater than or less than the P517 list value? equal to = P887; greater than (i.e., the combination of task scheduling options in the current P516 list is not as desirable as the previously identified best combination of task scheduling options; therefore, the P516 list combination of task scheduling options will not be used and the best combination of task scheduling options so far, as shown on the P517 list, remains unchanged) = P637; less than (i.e., the current P516 list value is better than the previous best value shown on the P517 list; therefore, the current P516 combination of task scheduling options becomes the new 'best so far' combination of task scheduling options) = P882

P887: Compare the value in data element (6) (P177 list entry groups with the calendar scheduling time of more than twice the task scheduling time) of the data elements at the top of the P516 list with the value in data element (6) on the P517 list. Is the P516 value equal to, greater than or less than the P517 value? equal to = P888; greater than = P637; less than = P882

P888: Compare the value in data element (5) (ratio of calendar time to task scheduling time) of the data elements at the top of the P516 list with the value in data element (5) on the P517 list. Is the P516 list value equal to, greater than or less than the P517 value? equal to = P889; greater than = P882; less than = P637

P889: Compare the value in data element (7i) (number of dated tasks that need to be rescheduled in this combination of task scheduling options) in the data elements at the top of the P516 list with the value in data element (7i) on the P517 list. Is the P516 value equal to, greater than or less than the P517 list value? equal to = P890; greater than = P637; less than = P882

P890: Compare the value in data element (7j) (total tasks that need to be rescheduled) in the data elements at the top of the P516 list with the value in data element (7j) on the P517 list. Is the P516 list value equal to, greater than or less than the P517 value? equal to = P891; greater than = P637; less than = P882

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- P891: Compare the value in data element (7h) (selected tasks that need to be rescheduled) in the data elements at the top of the P516 list with the value in data element (7h) on the P517 list. Is the P516 list value equal to, greater than or less than the P517 value? equal to = P892; greater than = P637; less than = P882
- P892: Compare the value in data element (7g) (selected tasks that need to be rescheduled) in the data elements at the top of the P516 list with the value in data element (7g) on the P517 list. Is the P516 list value equal to, greater than or less than the P517 value? equal to = P893; greater than = P637; less than = P882
- P893: Compare the value in data element (7f) (selected tasks that need to be rescheduled) in the data elements at the top of the P516 list with the value in data element (7f) on the P517 list. Is the P516 list value equal to, greater than or less than the P517 value? equal to = P894; greater than = P637; less than = P882
- P894: Compare the value in data element (7e) (selected tasks that need to be rescheduled) in the data elements at the top of the P516 list with the value in data element (7e) on the P517 list. Is the P516 list value equal to, greater than or less than the P517 value? equal to = P895; greater than = P637; less than = P882
- P895: Compare the value in data element (7d) (selected tasks that need to be rescheduled) in the data elements at the top of the P516 list with the value in data element (7d) on the P517 list. Is the P516 list value equal to, greater than or less than the P517 value? equal to = P896; greater than = P637; less than = P882
- P896: Compare the value in data element (7c) (selected tasks that need to be rescheduled) in the data elements at the top of the P516 list with the value in data element (7c) on the P517 list. Is the P516 list value equal to, greater than or less than the P517 value? equal to = P897; greater than = P637; less than = P882
- P897: Compare the value in data element (7b) (selected tasks that need to be rescheduled) in the data elements at the top of the P516 list with the value in data element (7b) on the P517 list. Is the P516 list value equal to, greater than or less than the P517 value? equal to = P898; greater than = P637; less than = P882
- P898: Compare the value in data element (7a) (selected tasks that need to be rescheduled) in the data elements at the

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top of the P516 list with the value in data element (7a) on the P517 list. Is the P516 list value equal to, greater than or less than the P517 value? equal to = P899; greater than = P637; less than = P882

- P899: Compare the value in data element (2c) (future scheduled tasks scheduled in this combination of task scheduling options) in the data elements at the top of the P516 list with the value in data element (2c) on the P517 list. Is the P516 list value equal to, greater than or less than the P517 value? equal to = P900; greater than = P882; less than = P637
- P900: Compare the value in data element (4) (incorrect time use time slots) of the data elements at the top of the P516 list with the value in data element (4) on the P517 list. Is the P516 list value equal to, greater than or less than the P517? equal to = P901; greater than = P637; less than = P882
- P901: Compare the value in data element (1) (number of pairs of ID27s used in the scheduling of the tasks in this combination of task scheduling options) at the top of the P516 list with the value in data element (1) on the P517 list. Is the P516 value equal to, greater than or less than the P517 value? equal to = P637; greater than = P637; less than = P882
- P902: (From P649): Are there any entries on the P516 list? Yes = P903; No = P907
- P903: Is the P491 flag a 'A' or a 'B'? A = P904; B = P907
- P904: Copy each of the P528 or P529 lists with a list label that is an entry on the current P516 list onto a P530 list (i.e., the task scheduling option list for the tasks in the best combination of task scheduling options so far). To do this, simply copy the P528 or P529 list and change the code in part (3) of the label of the new P530 list to be a 'c'.
- P905: Copy the P516 list to a P517 list (best combination of task scheduling options so far).
- P906: For each of the P526 lists (tasks that need to be rescheduled (for which the ID5 in part (1) of the P526 label is an entry on the P517 list, change the code in part (3) of the P526 list label to be a 'c' (best so far).
- P907: Erase all P528 and P529 lists. Also erase all P526 lists with a code of 'b' in part (3) of the label of the P526 list. Also erase the P516 list. The P530 lists (the

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labels for which are shown on the P517 list), i.e., the task scheduling options and the best combination of task scheduling options so far, are the task scheduling options that will be used for scheduling.

P908: Is the value in data element (2a) (currently being tasks tentatively scheduled in this combination of task scheduling options) on the top of the P517 list equal to '0'? Yes (i.e., it was not possible to identify any acceptable scheduling options for any of the currently being scheduled tasks in this iteration of FN1 and, therefore, no tasks will be scheduled in this iteration of FN1) = FN1.25 (P909); No = P1032

FN1.25: FOR each of the entries (task identifiers (ID23s)) on the P26 (already scheduled tasks) list:

P909: Identify the entry on the R2 list from P1 with the ID23 in this iteration of FN1.25 in data element (1).

P910: Identify the requirement application identifier (ID5) in data element (3) of the R2 list entry located in P909.

P911: Remove the ID5 identified in P910 from the P7 (all tasks) list.

P912: Erase the entire R2 list entry (all 11 data elements) located in P909 from the R2 list located in P1.

P913: NEXT FN1.25; end of FN1.25, GO TO P914.

P914: Is there now more than one entry on the P7 list? Yes = P50; No = P51

FN1.26: FOR each P526 list:

FN1.26.1: FOR each entry (task identifier (ID23)) on the P526 list for this iteration of FN1.26:

P915: Locate the DS24 data corresponding to the ID23 for this iteration of FN1.26.1.

P916: Change the answer to the question as to whether the task in this iteration of FN1.26.1 has been scheduled (i.e., an answer to one of the questions on the DS24 data located in P915) to be 'No' and enter the code of 'C' (task not scheduled because it needs to be rescheduled) as the explanation for why the task is not scheduled.

P917: Identify the start time slot information about the task in this iteration of FN1.26.1 on the DS24 data from P915, i.e., identify the time the task was previously scheduled to start.

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- P918: Locate the DS27 data corresponding to the ID27 that is part (1) of the start time slot information identified in P197. Locate the time slot on this DS27 data corresponding to the day and time slot number that are parts (2) and (3) of the start time slot information located in P917.
- P919: Beginning with the time slot located in P918 and following to each successive time slot (as identified on the DS27 data for the time slot) erase the scheduling information for the task in this iteration of FN1.26.1 from the DS27 data and any successive DS27 data sets identified on the time slot information identified in P918.
- P920: Erase all of the scheduling information (e.g., start and stop times, whether schedule before due date, number of interruptions, etc.) from the DS24 data located in P915.
- P921: Place the ID23 for this iteration of FN1.26.1 on the DL39 list.
- P922: NEXT FN1.26.1; end of FN1.26.1, GO TO P923.
- P923: NEXT FN1.26; end of FN1.26, GO TO FN1.27 (P929).
- P924: (From P879): Is the P491 flag a 'A' or a 'B'? A = P925;  
B = P928
- P925: Copy each of the P528 or P529 lists with a list label that is an entry on the current P516 list onto a P530 list (i.e., the task scheduling option list for the tasks in the best combination of task scheduling options so far). To do this, simply copy the P528 or P529 list and change the code in part (3) of the label of the new P530 list to be a 'c'.
- P926: Copy the P516 list to a P517 list (best combination of task scheduling options so far).
- P927: For each of the P526 lists (tasks that need to be rescheduled (for which the ID5 in part (1) of the P526 label is an entry on the P517 list, change the code in part (3) of the P526 list label to be a 'c' (best so far).
- P928: Erase all P528 and P529 lists. Also erase all P526 lists with a code of 'b' in part (3) of the label of the P526 list. Also erase the P516 list. The P530 lists (the labels for which are shown on the P517 list), i.e., the task scheduling options and the best combination of task scheduling options so far, are the task scheduling options that will be used for scheduling.

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FN1.27: FOR each P517 list entry:

- P929: Identify the code ('a' or 'b') in data element (3) of the P517 list entry for this iteration of FN1.27. Is this code a 'b' (currently being formed)? Yes = P930; No = P941 (next FN1.27)
- P930: Identify the ID5 in data element (1) of the P517 list entry for this iteration of FN1.27.
- P931: Locate the P530 list with the ID5 from P930 as the first part of its label.
- P932: Identify the code (1-3) in data element (1) (whether being currently scheduled, already scheduled or future scheduled task) at the top of the P530 list located in P931. Is this code a '2'? Yes = P933; No = P941 (next FN1.27)
- P933: Locate the R2 list entry with the ID5 from P930 in its data element (3).
- P934: Identify the task identifier (ID23) in data element (1) of the R2 list entry from P933.
- P935: Locate the DS24 data corresponding to the ID23 from P934.
- P936: Change the answer to the question as to whether the task in this iteration of FN1.27 has been scheduled (given on the DS24 data located in P935) to be 'No' and enter the code of 'C'? Task not scheduled because it needs to be rescheduled) as the explanation for why the task is not scheduled.
- P937: Identify the start time slot information about the task in this iteration of FN1.27 on the DS24 data from P935, i.e., identify the time that the task was previously scheduled to start.
- P938: Locate the DS27 data corresponding to the ID27 that is part (1) of the start time slot information identified in P937. Locate the time slot on this DS27 data corresponding to the day and time slot number that are parts (2) and (3) of the start time slot information located in P937.
- P939: Beginning with the time slot located in P938 and following to each successive time slot (as identified on the DS27 data for the time slot) erase the scheduling information for the task in this iteration of FN1.27 from the DS27 data sets.

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P940: Erase all of the scheduling information (e.g., start and stop time, whether the task was scheduled before the due date, etc.) from the DS27 data located in P935.

P941: NEXT FN1.27; end of FN1.27, GO TO P942.

P942: Is the value in data element (2c) (future scheduled tasks scheduled in this combination of task scheduling options) at the top of the P517 list a '0'? Yes = FN1.28 (P943); No = FN1.29 (P966)

FN1.28: FOR each entry (i.e., each P528/P529 list label) on the P517 list:

P943: Identify the requirement application identifier (ID5) in data element (1) of the P517 list entry for this iteration of FN1.28.

P944: Locate the P530 list with the ID5 from P943 as the first part of this label.

P945: Identify the code (1-3) in data element (1) at the top of the P530 list located in P944. Is this code a '3' (future scheduled task)? Yes = P946; No = P965 (next FN1.28)

P946: Locate the DS4 data corresponding to the ID5 from P943. Identify the DS1 data corresponding to the requirement identifier (ID6), if any, on this DS4 data.

P947: Generate a new DS5 data set based on the DS4 data and DS1 data from P946; assign the next available requirement implementation identifier (ID9) from R7.

P948: Is the DS4 data from P946 Reminder Notice type of suspense data (i.e., not a requirement)? (Note: This is shown on the DS4 data.) Yes = P949; No = P951

P949: Add the ID9 assigned in P947 for the new DS5 data to the DL9 list.

P950: GO TO P952.

P951: Add the ID9 assigned to the newly generated DS5 data in P947 onto the DL3 list.

P952: Calculate the new 'next suspense date' for the DS4 data from P946 (using the 'suspense interval' data on the DS4 data). Is this new next suspense date later than the 'last suspense date' on the DS4 data? Yes = P953; No = P955

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- P953: Deactivate the DS4 data, i.e., place the current date (R5) in the deactivation date for the DS4 data and remove the ID5 identifying the DS4 data from the DL11 list. Delete the entry for the ID5 identified in P943 from the DL32 list.
- P954: GO TO P956.
- P955: Replace the old 'next suspense date' on the DS4 data from P946 with the new 'next suspense date' calculated in P952.
- P956: Locate the entry on the R2 list from P1 that contains the ID5 identified in P943 in its data element (3).
- P957: Identify the task type code (CT8) in data element (6) of the R2 list entry located in P956.
- P958: Locate the DS23 data corresponding to the CT8 identified in P957. Also locate the DS25 data, if any, corresponding to this CT8.
- P959: Using the DS23 data and the DS25 data from P958, generate a new set of DS24 data for the future scheduled task the scheduling of which is shown on the P530 list located in P944. (Follow the instructions given in P4 of Step F4A-1.) Assign the next available task identifier (ID23) from R8 to the new DS24 data. The ID9 placed on the new DS24 data should be the ID9 assigned to the new DS5 data generated in P947.
- P960: Fill in data element (1) on the R2 list entry located in P956 with the task identifier (ID23) assigned to the new DS24 data generated in P959. Also enter this ID23 onto data element (13) of the data elements at the top of the P530 list located in P944.
- P961: Add the ID23, the OHMIS service area identifier (ID10) and ID9 assigned to the new DS4 data onto the DL38 list.
- P962: Add the ID23, the ID10 and the requirements implementation units assigned to the new DS24 data, and the answer of 'Yes' (whether this is an 'employee transport' type of task) to the DS36 list.
- P963: Add the ID23, the ID10 and facility identifier (ID8), if any, assigned to the new DS24 data to the DL37 list.
- P964: Add the CT8 from P957 and the ID23 assigned in generating the new DS24 data to the DS5 data generated in P947.
- P965: NEXT FN1.23; end of FN1.23, GO TO FN1.29 (P966).



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FN1.29: FOR each entry on the P517 list:

- P966: Identify the ID5 in data element (1) of the P517 list entry for this iteration of FN1.29.
- P967: Locate the P530 list with the ID5 from P966 in part (1) of its label.
- P968: Identify the ID23 in data element (13) at the top of the P530 list from P967.
- P969: Locate the DS24 data corresponding to the ID23 identified in P968.
- P970: Using the P530 list located in P967, begin to enter scheduling information for the task identified in P968. First complete the DS24 data. Answer the question on the DS24 data as to whether the user specified the schedule as 'No'. Answer the question as to whether it was possible to schedule the task as 'Yes' (change the previous answer of 'No' and remove the code explaining why it was not possible to schedule this task from the DS24 data). For the start time slot information, enter the time slot information in data element (2) of the first entry on the P530 list located in P967. For the end time slot, use the time slot information in data element (2) in the last entry on the P530 list. For the total number of time slots actually scheduled and the total number of interruptions required for the scheduling of the task, use the value in data element (2) and (3) at the top of the P530 list. Answer the question about whether the task was scheduled after the due date as 'No'. Answer the question about whether it was possible to schedule the task during the preferred time use (CT11) as 'Yes', if the answer in data element (8) on each entry on the P530 list from P967 was 'Yes'; if there is an answer of 'No' in data element (8) for any entry on the P530 list, answer the question 'No'.
- P971: Identify the code (1-3) in data element (1) at the top of the P530 list located in P967. Is the code a '1', '2' or '3'? 1 = P974; 2 = P976; 3 = P972
- P972: Remove the ID5 identified in P966 from the P29 list.
- P973: GO TO P981.
- P974: Remove the ID23 identified in P968 from the P21 list.
- P975: GO TO P977.

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P976: Remove the ID23 identified in P968 from the P26 list.

P977: Is the ID23 from P968 on the DL31 list? Yes = P978; No = P979

P978: Remove the ID23 identified in P968 from the DL31 list.

P979: Is the ID23 from P968 on the DL39 list? Yes = P980; No = P981

P980: Remove the ID23 identified in P968 from the DL39 list.

P981: Remove the ID5 identified in P966 from the P7 list.

FN1.29.1: FOR each entry on the P530 list located in P967:

P982: Identify the ID27 contained in part (1) of the time slot information given in data element (2) of the P530 list entry for this iteration of FN1.29.1.

P983: Locate the DS27 data corresponding to the ID27 from P982.

P984: On the DS27 data from P983, locate the time slot equivalent to part (2) (day) and part (3) (time slot number) of the data element (2) on the P530 list entry for this iteration of FN1.29.1.

P985: Fill in the empty fields in the time slot identified in P984 on the DS27 data located in P983 as follows: The task identifier should be the ID23 from P968. The answer as to whether this task needs a Scheduling Notice is 'Yes'. The time use code is from data element (9) at the top of the P530 list located in P967. The answer as to whether the task was scheduled at the specification of the user is 'No'. The answer as to whether there are any restrictions for the scheduling of the task is given in data element (11) at the top of the P530 list located in P967. The total standard hours for completing the task is given in data element (12) at the top of the P530 list. The user specified hours for scheduling the task is only known for 'already scheduled' tasks, i.e., tasks having the code of '2' (as identified in P971). This value is on the DS24 data. If the code was not a '2', the user specified hours for scheduling is the same as the standard hours for scheduling. The actual hours for scheduling the task is given in data element (2) at the top of the P530 list from P968. The cumulative number of time slots scheduled for the task and the cumulative number of interruptions as of the time slot for scheduling the task represented by this iteration of FN1.29.1 is given on data elements (4) and (5) of the P530 list entry for this iteration of FN1.29.1. The time slot for the next time

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same as the value for this iteration of FN1.31? Yes = P999; No = P1019 (next FN1.31.1)

P999: Identify the code (1-3) in data element (2) of the R2 list entry for this iteration of FN1.31.1. Is this code a '1' or '3'? (Note: The code cannot have been a '2'.) 1 = P1000; 3 = P1017

P1000: Identify the task type code (CT8) in data element (6) and the OHMIS service area identifier (ID10) in data element (5) on the R2 list for this iteration of FN1.31.1.

P1001: Identify the employee identifiers (ID4s) on the DL34 list for the CT8 and ID10 from P1000.

FN1.31.1.1: FOR each ID4 identified in P1001:

P1002: Examine the DL40 list and determine whether there are any entries (weekly schedule identifiers (ID28s)) for the ID10 from P1001 and the ID4 for this iteration of FN1.31.1.1. Yes = P1012; No = P1003

P1003: NEXT FN1.31.1.1; end of FN1.31.1.1, GO TO P1004.

P1004: IDENTIFY the task identifier (ID23) in data element (1) of the R2 list entry for this iteration of FN1.31.1.

P1005: Locate the DS24 data corresponding to the ID23 from P1004.

P1006: Answer the question on the DS24 data from P1005 about whether the task was scheduled as 'No' and put the code 'B' (cannot schedule, because there is no weekly schedule data (DS26) for any of the persons qualified to perform the task) on the DS24 data from P1005. Also determine if the ID23 identified in P1004 is on the DL31 list, and, if not, place the ID23 on the DL31 list.

P1007: Remove the ID23 identified in P1004 from the P21 list.

P1008: Identify the ID5 in data element (3) of the R2 list entry for this iteration of FN1.31.1.

P1009: Remove the ID5 identified in P1008 from the P7 list. GO TO P1019 (next FN1.31.1).

P1010: Erase the entire R2 list entry for this iteration of FN1.31.1 from the R2 list located in P1.

P1011: GO TO P1019 (next FN1.31.1).

P1012: Identify the ID5 in data element (3) of the R2 list entry for this iteration of FN1.31.1.

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slot in which this task is scheduled is given in data element (2) of the next P530 list, if any, i.e., the P530 list entry for the next iteration of FN1.29.1. If this is the last P530 list entry, this information should be left blank on the DS27 data.

P986: NEXT FN1.29.1; end of FN1.29.1, GO TO P987.

P987: Erase the P530 list identified in P967.

P988: Locate the entry on the R2 list from P1 with the ID5 from P966 as its data element (1).

P989: Erase the entire R2 list entry (all 11 data elements) located in P988 from the R2 list located in P1.

P990: NEXT FN1.29; end of FN1.29, GO TO P40.

P991: (From P490): Start a list, called the P991 list. This list will contain the labels of P476 lists, i.e., the user group numbers from data element (11) on the R2 list entries.

FN1.30: FOR each entry on the P402 list (i.e., for each user group number from data element (11) on an R2 list entry:

P992: Locate the P476 list entry with the value from this iteration of FN1.30 as its label.

P993: Examine the P476 list located in P992. Does this list have any entries on it, i.e., is the value in the data element at the top of the P476 list indicating the number of entries on the list greater than '0'? Yes = P995 (next FN1.30); No = P994

P994: Put the value for this iteration of FN1.30 onto the P991 list.

P995: NEXT FN1.30; end of FN1.30, GO TO P996.

P996: Are there any entries on the P991 list? Yes = P997; No = P491

P997: Start a list, called the P997 list. This list will contain ID5s.

FN1.31: FOR each entry on the P991 list:

FN1.31.1: FOR each entry on the R2 list located in P1:

P998: Examine the value in data element (11) on the R2 list entry for this iteration of FN1.31.1. Is the value the

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- P1013: Erase the ID5 identified in P1012 from the P7 list.
- P1014: Erase the ID23 identified in P1004 from the P21 list.
- P1015: Place the ID5 on the P997 list.
- P1016: GO TO P1019 (next FN1.31.1).
- P1017: Identify the ID5 in data element (3) of the R2 list entry for this iteration of FN1.31.1.
- P1018: Erase the ID5 identified in P1017 from the P29 list. GO TO P1010.
- P1019: NEXT FN1.31.1; end of FN1.31.1, GO TO P1020.
- P1020: NEXT FN1.31; end of FN1.31, GO TO P1021.
- P1021: Are there now any entries on the P21 (currently being scheduled tasks) list? Yes = P1022; No = P41
- P1022: Are there any entries on the P997 list? Yes = FN1.32 (P1026); No = P1023
- P1023: Is the ID23 for this iteration of FN1 on the P21 list? Yes = P491; No = P1024
- P1024: Change the task identifier (ID23) that is the label on the R2 list from P1 (i.e., for this iteration of FN1) to be one of the ID23s on the P21 list).
- P1025: Locate the ID23 for this iteration of FN1 on the R1 list (i.e., on the Step F4A-2 P25 list) and replace the ID23 with the ID23 used in P1024 to relabel the R2 list from P1. (Note: It is important that this new label (ID23) on the R1 list be put in the same spot on the list as the ID23 for this iteration of FN1, not at the end of the R1 list. If this is not done, the program will repeat itself, because the program arrive at the ID23 from the relabeled R2 list a second time.) Also, replace the ID23 for this iteration of FN1 with the ID23 used in P1024 to relabel the R2 list from P1. That is, change the ID23 for this iteration of FN1 so that the program will consider this iteration of FN1 to be processing the group of task with the new label identified in P1024. This is rational, because the R2 list being processed in this iteration of FN1 has not changed, only the label for this R2 list has changed. GO TO P491.
- FN1.32: FOR each entry on the P997 list:

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P1026: Locate the entry (i.e., set of 11 data elements) on the R2 list from P1 for the ID5 for this iteration of FN1.32.

P1027: Identify the task identifier (ID23) in data element (1) on the R2 list entry located in P1026.

P1028: Generate a new R2 list (i.e., a new Step F4A-2 P24 list). Put the ID23 from P1027 as the label on the new R2 list. Copy the R2 list entry from this iteration of FN1.32 (as located in P1026) onto the new R2 list as the first (and only) entry (set of 11 data elements) on the new R2 list. (Generate a new R2 list each time P1028 is executed, i.e., do not erase previously generated R2 lists. Treat the R2 lists as though they were generated in P24 of Step FA-2.)

P1029: Remove the entire data entry (all 11 data elements) for the R2 list data entry located in P1026 from the R2 list located in P1.

P1030: Add the ID23 for this iteration of FN1.32 to the R3 list (i.e., the Step F4A-2 P68 list of labels of P24/R2 lists that contain only one task).

P1031: NEXT FN1.32; end of FN1.32, GO TO P491.

P1032: Are there any P526 lists? Yes = FN1.33 (P1033); No = FN1.27 (P929)

FN1.33: FOR each P526 list:

FN1.33.1: FOR each entry (task identifier (ID23)) on the P526 list for this iteration of FN1.33:

P1033: Locate the DS24 data corresponding to the ID23 for this iteration of FN1.33.1.

P1034: Identify the start time slot information for the task in this iteration of FN1.33.1 on the DS24 data from P1033, i.e., identify the time that this task was previously scheduled to start.

P1035: Using the DS24 data located in P1033, determine whether the task for this iteration of FN1.33.1 has more than one person scheduled to perform the task. Yes = P1036; No = FN1.26 (P915)

P1036: Identify the up to 3 monthly schedule identifiers (ID27) on the DS24 data located in P1033 that specify the monthly schedule data (DS27) on which the scheduling for the task for the addition persons scheduled to perform the task is shown to start. Put the starting ID27s on a temporary list, called the P1036 list.

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FN1.33.1.1.1: FOR each ID27 on the P1036 list:

P1037: Locate the DS27 data corresponding to the ID27 for this iteration of FN1.33.1.1.

FN1.33.1.1.1.1: FOR each time slot in which the task in this iteration of FN1.33.1 is already scheduled and is, therefore, also to be scheduled for an additional person to perform the task at the same time, beginning with the date of the month and the time slot number that are parts (2) and (3) of the start time slot identified in P1034 on the DS27 data located in P1037 and continuing with the time slot identified in P1040.

P1038: Locate the time slot for this iteration of FN1.33.1.1.1. (Follow the instructions given in P15 of Step F4B-1.)

P1039: Determine whether the scheduling of the task continues to another time slot. (This information is shown on the DS27 data for the time slot for this iteration of FN1.33.1.1.1 as located in P1038.) Yes = P1040; No = P1043 (next FN1.33.1.1)

P1040: Identify the next time slot in which the scheduling of this task will continue. (From the DS27 data for the 1038 time slot.)

P1041: Erase all of the scheduling information for the task in this iteration of FN1.33.1 from the DS27 data time slot located in P1038.

P1042: NEXT FN1.33.1.1.1. (End of FN1.33.1.1.1 will not be reached.)

P1043: NEXT FN1.33.1.1, end of FN1.33.1.1, GO TO P1044.

P1044: Change the answer to the question on the DS24 data located in P1033 about whether there are additional persons scheduled to perform this task to be 'No'. Erase the information about the additional persons previously scheduled to perform this task shown on the DS24 data.

P1045: GO TO FN1.26 (P915).

P1046: NEXT FN1; end of FN1, GO TO P1047.

P1047: Are there any entries on the R4 list (i.e., the Step F4A-2, P71 list of labels of P24 (R2) lists containing groups of employee transport tasks, none of which are 'already scheduled' tasks)? Yes = P1048; No = P1049

P1048: GO TO P1 of Step F4A-4.

STEP F4A-3

P1049: Are there any entries on the R3 list (i.e., the Step F4A-2 P68 list of labels of P24 (R2) lists containing only one employee transport task)? Yes = P1050; No = P1051

P1050: GO TO P1 of Step F4A-5.

P1051: GO TO P15 of Step F4A-2.

OUTPUTS AND GENERATION OF DATA SETS:

DS5: Requirements implementation data

DS24: Specific task scheduling data

(Note: No Scheduling Notices (015) outputs are generated in Step F4A-3, because the newly scheduled tasks all begin at the same time or after a 'already scheduled' task for which the



#### STEP F4A-4

In this Step, the groups of employee transport tasks (i.e., more than one task for a given employee) that do not include any 'already scheduled' tasks are scheduled. The processing for this Step is very similar to that of Step F4A-3 and will not, therefore, be repeated here. As with all other scheduling steps in Function F4A (i.e., Steps F4A-3 through F4A-7) the program attempts to optimize the scheduling for the task by first attempting to schedule the task with the most rigid scheduling selection criteria (e.g., no interruptions, preferred time use, etc.) and, failing that, make successive attempts to schedule the tasks, each with less rigid scheduling selection criteria.

The major differences between Step F4A-4 and Step F4A-3 are:

- 0 Like Step F4A-3, Step F4A-4 processes data using a series of lists of information about the tasks, where all of the tasks on the same list are employee transport tasks for the same employee. These lists were formed in Step F4A-2 and were referred to as P24 lists in that Step (the name was changed to 'R2 lists' in Step F4A-3). These lists are similar to those used in Step F4A-3, except that they include no "already scheduled" tasks. Each list may contain 'future scheduled' tasks and must contain at least one 'currently being scheduled' task. The corresponding list of labels for these series of lists was formed in P71 of Step F4A-2. If, for one of the various reasons identified in Step F4A-3, it was found necessary in that step to exclude all of the 'already scheduled' tasks from a groups of tasks being processed in Step F4A-3, this group of tasks would then be processed in Step F4A-4 (or Step F4A-5, if there was only one task remaining on the list after the 'already scheduled' tasks had been excluded). This means that Step F4A-4 (and F4A-5) will be working from lists of tasks formed in either Step F4A-2 or Step F4A-3.
- 0 As with Step F4A-3, the major aim of the Step F4A-4 scheduling process is to schedule all employee transport tasks for a given employee at approximately the same time. This means that it will be necessary to again form scheduling maps (referred to as P177 list entry groups in Step F4A-3) in Step F4A-4. These scheduling maps define what constitutes "approximately at the same time". The major difference, is that while in Step F4A-3 these scheduling maps could be defined at the beginning of the processing by defining a scheduling map to begin with an already scheduled task and end up to 9 hours later (or when the next already scheduled task for the same employee begins), the predefining process cannot take place in Step F4A-4. This is because there are no already scheduled tasks to use to predefine scheduling maps. Instead, such scheduling maps will need to be formed whenever a search

#### STEP F4A-4

for scheduling options begins and as soon after the first task in the combination of task scheduling options has been tentatively scheduled. As with Step F4A-3, the process of defining scheduling maps is made more complex by the fact that not all tasks in a given group will necessarily be such that they can be performed by the same person. For this reason (as well as the fact that the tasks in a group may have other differing characteristics such as different preferred time uses), it is not possible to simply group all of the tasks in a task group together and schedule them as though they were one task.

- o Employee transport tasks are more difficult to schedule than other tasks in which employees are not participants (i.e., employees are only performers of the task), because it is necessary to ensure that the tasks for the same employee are not scheduled at the same time. In Step F4A-3, this problem was more easily addressed because all of the already scheduled task were known and considered in the groups of tasks being scheduled. Therefore, when one task was scheduled, the entire calendar time for that task was "blocked off" for scheduling for other tasks. In Step F4A-4 (and Step F4A-5) there are either no 'already scheduled' tasks (in which case the overlapping of tasks is not a scheduling problem) or the already scheduled tasks have been removed from the group of tasks being scheduled, in which case it is necessary to check before scheduling a task in a time slot to determine that this calendar time slot is not already scheduled for the same employee. It should be noted that this involves not merely checking the time slot on the monthly schedule data (DS27) which is being used to attempt to schedule the task. It also requires checking the same calendar time slots in all sets of DS27 data because the employee could be scheduled for a task in the same calendar time slot but the person performing the other task is different from the task tentatively being scheduled (and thus would not be shown on the DS27 data being scheduled as being tentatively scheduled).

- o In Step F4A-3, Scheduling Notices (015) were not sent out after the tasks were scheduled, because the employee participating in the task had already been notified of the time in which the scheduling of the task was scheduled to begin, when the 'already scheduled' tasks next to which the tasks in the groups in Step F4A-3 are being tentatively scheduled were previously scheduled. In Step F4A-4 (and Step F4A-5), it will be necessary to send Scheduling Notices (see the procedure in Step F4A-6), because the scheduling of these tasks will begin at a time not previously scheduled for tasks for the employee participating in the tasks.

STEP F4A-4

PREVIOUS STEP: Step F4A-4 follows P77 of Step F4A-2 and P1048 of Step F4A-3.

#### STEP F4A-5

In this Step, single employee transport tasks (i.e., employee transport tasks for which there are no 'already scheduled' tasks or 'future scheduled' tasks and only one 'currently being scheduled' task for the same employee) are scheduled. The processing for this Step is very similar to that of Step F4A-3 and will not, therefore, be repeated here. The major differences between Step F4A-5 and Step F4A-3 are similar to those differences between Step F4A-4 and Step F4A-3, as described in Step F4A-4. The additional differences are:

- o Step F4A-5 uses the P24 list formed in Step F4A-2 that contain only one task. The "list" containing the one label for this one task in this "group" of tasks, was formed in P68 in Step F4A-2.
- o It is not necessary to form scheduling maps for scheduling tasks in Step F4A-5.
- o Because Step F4A-5 is the last Step in which there is an opportunity to schedule an employee transport task, one of the most rigid criteria for scheduling tasks, that of scheduling a task to end before its due date (if any), may have to be waived so as to enable scheduling the task at all. As with the other Steps in Function F4A, the program "tries" all scheduling options that have scheduling dates before the due date for the task first, and only resorts to the scheduling of a task after its due date, if no other scheduling options are possible. This means that other less than ideal scheduling options (such as scheduling the task in a time use that is not the preferred time use) will be attempted first. (Note: This same difference in the scheduling process also applies to Step F4A-7, i.e., the scheduling processing used to schedule single non-employee transport tasks.)

PREVIOUS STEP: Step F4A-5 follows P78 of Step F4A-2, P1050 of Step F4A-3 and the equivalent step in Step F4A-4.

#### STEP F4A-6

The program attempts to schedule each task that needs to be scheduled (that was not already scheduled in Step F4A-2, i.e., that is not an 'employee transport' type of task). In this Step the program attempts to schedule the task "next to" (immediately following) other already scheduled tasks that are similar to the task being scheduled.

The program is organized to both optimize the similarity of the tasks next to which a task is scheduled and to minimize the number of interruptions in the scheduling of a task. The order of preference for determining which task to schedule the task next to is to schedule the task next to (in descending order of preference):

- 1) A task that will be conducted in the same facility and involves the same exact requirement implementation unit(s) as the task being scheduled and requires no interruptions, of any kind, to schedule the task.
- 2) A task that will be conducted in the same facility and has, as one of its requirement implementation units, the same employee, job class or organizational unit as the task being scheduled and requires no interruptions, of any kind, to schedule the task.
- 3) A task that will be conducted in the same facility and involves no interruptions, of any kind, to schedule the task.
- 4) A task that will be conducted in the same facility and involves the same requirement implementation unit(s) as the task being scheduled; and, requires no interruptions, except for breaks in the time available for scheduling (i.e., no interruptions for other tasks, other time uses, or restrictions on the scheduling of the task; the only interruptions are for breaks in the time that the person performing the task has available for any type of scheduling, such as breaks for the end of the day, for lunch, etc.; by allowing only this type of interruption it is ensured that the task will not be interrupted by other tasks (i.e., the current interruptions will not later be filled by other tasks), because no tasks can be scheduled during interruptions for breaks); and, requires the smallest number of such break-type of interruptions compared to other tasks that are to be conducted in the same facility as the task being scheduled.
- 5) A task that will be conducted in the same facility and has, as one of its requirements implementation units, the same employee, job class or organizational unit as the

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task being scheduled; requires no interruptions, except for breaks; and requires the smallest number of such break-type interruptions (compared to other tasks that are to be conducted in the same facility as the task being scheduled).

- 6) A task that will be conducted in the same facility and has no interruptions except for breaks and has the smallest number of these interruptions compared to other tasks that are to be conducted in the same facility as the task being scheduled.
- 7) A task that involves the same requirement implementation units and requires no interruptions, of any kind, to schedule the task.
- 8) A task that has, as one of its requirement implementation units, the same employee, job class or organization unit as the task being scheduled and requires no interruptions, of any kind, to schedule the task.
- 9) A task that involves the same requirement implementation unit(s) and requires no interruptions, except for breaks, and requires the smallest number of such break-type interruptions compared to other tasks involving either the same requirement implementation unit or has, as one of its requirement implementation units, the same employee, job class or organizational unit as the task being scheduled.
- 10) A task that has, as one of its requirement implementation units, the same employee, job class or organizational unit as the task being scheduled and requires no interruptions, except for breaks, and requires the smallest number of such interruptions compared to other tasks having, as one of their requirement implementation units, the same employee, job class or organizational unit as the task being scheduled.

The program logic in Step F4A-6 identifies all of the options for scheduling a task next to a similar task and then chooses the option with the highest preference, according to the above order of preference.

If there is no already scheduled task that is similar to the task being scheduled, or, if it is not possible to schedule the task next to a similar task without resulting in interruptions (except breaks), then the task is not scheduled next to a similar task, i.e., it is scheduled in the earliest available time slot using the program logic given in Step F4A-7.

As with all scheduling, the program checks to ensure that the task is scheduled to be completed before its due date and within the time

#### STEP F4A-6

slots with the preferred time use that is the same as the time use required for the task. If it is not possible to schedule the task before the due date and within the preferred time use restrictions given by the user, while being scheduled "next to" another similar task, then attempts to schedule the task next to other similar tasks are abandoned, i.e., being scheduled within the due date and within the preferred time use takes precedence over scheduling the task next to other similar tasks. These tasks are therefore scheduled in Step F4A-4.

PREVIOUS STEP: Step F4A-6 follows P16 of Step F4A-2.

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

- R1: The list of task identifiers (ID23) for the non-employee transport type of tasks that currently need to be scheduled; from the list generated in P12 of Step F4A-2
- R2: Current date
- R3: The list of task identifiers (ID23) for the tasks that were newly determined (i.e., determined in this execution of Function F4A) to be unscheduleable because there are no persons qualified to perform the task in the OHMIS service area (ID10) in which the task originated. From the P5 list from Step F4A-2.
- DS23: Task description data
- DS24: Specific task scheduling data
- DS26: Regular weekly schedule availability data
- DS27: Monthly schedule data (availability and use)
- DL31: List of task identifiers (ID23) for tasks that cannot be scheduled by OHMIS service area (ID10)
- DL33: List of monthly schedule identifiers (ID27) by OHMIS service area (ID10)
- DL34: List of qualified employee identifiers (ID4) by task type (CT8) and by OHMIS service area (ID10)
- DL36: List of requirement implementation units (or sets of units) linked to their corresponding task identifier (ID23), OHMIS service area identifier (ID10) and

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whether the task is an 'employee transport' type of task

DL37: List of the task identifier (ID23) by the main facility identifier (ID8) in which the task will take place and by its OHMIS service area (ID10)

DL39: List of task identifiers (ID23) for tasks that need to be rescheduled by OHMIS service area (ID10)

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

P1: Generate a copy of R1 list, i.e., the list of non-employee transport type of tasks that are to be scheduled in this execution of Function F4A. This list is called the P1 list. Retain the P1 list throughout Step F4A-6.

FN1: FOR each of the task identifiers (ID23) on the P1 list:

P2: Locate the DS24 data corresponding to the ID23.

P3: Locate the task type code (CT8) on the DS24 data from P2.

P4: Locate the DS23 data corresponding to the CT8 from P3.

P5: Using the DS23 data from P4, determine whether this is a task of the type requiring a Scheduling Notice (015).

P6: Store a flag to indicate what type of iteration of Step F4A-3 processing the program is going through. This will be referred to as the P6 flag. At this stage, store the flag 'A'.

P7: Using the DS24 data from P2, identify the OHMIS service area identifier (ID10), the requirement implementation unit(s), the time use code (CT11), due date (if any) and the user specified number of time slots required to complete the task, for the task in this iteration of FN1.

P8: Using the DL34 list, identify the employee identifier(s) (ID4) of the person(s) qualified to perform the task in this iteration of FN1, i.e., the persons qualified to perform the tasks with the task-type code (CT8) identified in P3 for the OHMIS service area (ID10) from P7. Put on a temporary list called the P8 list.

P9: Does the DS24 data from P2 contain a facility identifier (ID8), i.e., specify the location in which the task is going to be conducted? Yes = P12; No = P10



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- P10: Change the P6 flag to a 'B'.
- P11: GO TO P16.
- P12: Identify the ID8 from the DS24 data from P2.
- P13: Are there any task identifiers (ID23) on the DL37 list for the same ID10 as that identified in P7 and the same ID8 as that identified in P12 that are not also on the R3 list, i.e., any tasks that are going to be conducted in the same facility as the task in this iteration of FN1? Yes = P14; No = P10
- P14: Generate a temporary list, called the P14 list, of the ID23s on the DL37 list that have the same ID10 and ID8 as the task in this iteration of FN1 that are not also on the R3 list.
- P15: GO TO P27.
- P16: Are there any task identifiers (ID23) on the DL36 list which have the same set of requirement implementation units and ID 10 as the requirement implementation unit(s) and ID10 for the task in this iteration of FN1 (as determined in P7) and which are not on the R3 list? Yes = P17; No = P19
- P17: Generate a list, called the P17 list, of the task identifiers (ID23) on the DL36 list that have the same requirement implementation unit(s) and ID10 as the task in this iteration of FN1 and that are not on the Re list.
- P18: GO TO P27.
- P19: Change the P6 flag to a 'C'.
- P20: Do the requirement implementation unit(s) for the task in this iteration of FN1 (as determined in P7) include an employee identifier (ID4), job class identifier (ID7) or organizational unit identifier (ID12)? Yes = P24; No = P21
- P21: Change the P6 flag to a 'D'.
- P22: Add the ID23 for this iteration of FN1 to a list called the P22 list. (Also keep this ID23 on the P1 list.) (Note: Do not generate a new P22 list for each iteration of FN1; simply add the ID23 on the P22 list that was generated in the first iteration of FN1 in which substep P22 was reached.)
- P23: GO TO P153 (Next FN1).

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- P24: Identify the employee identifier (ID4), job class identifier (ID7) and/or organizational unit identifier (ID12) that is (are) included in the requirement implementation unit(s) for the task in this iteration of FN1 (as determined in P7). If more than one of the requirement implementation units are ID4, ID7 or ID12 types of identifiers, put the entire set of ID4, ID7 and/or ID12 identifiers on a list, called the P24 list.)
- P25: Are there any task identifiers (ID23) on the DL36 list that have the same employee identifier (ID4), job class identifier (ID7) or organizational unit identifier (ID12) as that identified in P24 (or as those that are on the P24 list) and that are not on the R3 list? Yes = P26; No = P21
- P26: Put the task identifiers (ID23) on the DL36 list that have the same ID4, ID7 or ID12 as that from the task in this iteration of FN1 and that are not on the R3 list on a temporary list called the P26 list.
- P27: Identify which list of ID23s to use in FN1.1. If the P6 flag is an 'A', use the P14 list; if it is a 'B', use the P17 list; if it is a 'C', use the P26 list.
- FN1.1: FOR each ID23 on the list identified in P27:
- P28: Is the ID23 also on the P1 list, i.e., one of the task currently being scheduled? Yes = P51 (next FN1.1); No = P29
- P29: Locate the DS24 data corresponding to the ID23 for this iteration of FN1.1; locate the task type code (CT8) on this DS24 data; locate the DS23 data corresponding to this CT8.
- P30: Is the DS23 data from P29 for an employee transport type of task? Yes = P51 (next FN1.1); No = P31
- P31: Using the DS24 data from P29, identify the requirement implementation unit(s) and time use code (CT11) for the task in this iteration of FN1.1.
- P32: Using the DS24 data from P29, obtain the time slot information (i.e., the monthly schedule identifier (ID27) and date and time slot number (number from '1' to '96' for the quarter of an hour during a day)) for the end time on which the task in this iteration of FN1.1 is scheduled to be completed.

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- P33: Is the end time slot identified in P32 before the current date (R2)? Yes = P51 (next FN1.1); No = P34
- P34: Is there a due date on the DS24 data from P2 (as determined in P7)? Yes = P35; No = P36
- P35: Is the due date for the task in this iteration of FN1 (as determined in P7) equal to or earlier than the data for which the task in this iteration of FN1.1 is scheduled to end (i.e., the end time for the scheduling of this task as determined in P32)? Yes = P36; No = P51 (next FN1.1)
- P36: Locate the DS27 data corresponding to the monthly schedule identifier (ID27) that is contained in the end time slot information for the task in this iteration of FN1.1 (as determined in P32). Locate the employee identifier (ID4) on this DS27 data, i.e., the person to be scheduled to perform the tasks on this DS27 data.
- P37: Is the ID4 identified in P36 one of the ID4s on the P8 list? Yes = P38; No = P51 (next FN1.1)
- P38: Is the P6 flag a 'A', 'B' or 'C'? (Note: It cannot be a 'D', because the program would not have reached P38, if it were.) A = P39; B = P48; C = P50
- P39: Are the requirement implementation units for the task in this iteration of FN1.1 (as determined in P31) the same as those for the task in this iteration of FN1 (as determined in P7)? Yes = P40; No = P42
- P40: Put the ID23 for this iteration of FN1.1 on a temporary list called the P40 list. The P40 list is a list of already scheduled tasks that are scheduled for the same facility and requirement implementation unit(s) as the task in this iteration of FN1 and which are scheduled in a time slot next to which it is acceptable to schedule the task in this iteration of FN1.
- P41: GO TO P51 (next FN1.1).
- P42: Do the requirement implementation units for the task for this iteration of FN1 (as determined in P7) include an employee identifier (ID4), job class identifier (ID7) or organizational unit identifier (ID12)? Yes = P45; No = P43
- P43: Put the ID23 for this iteration of FN1.1 on a temporary list called the P43 list; the P43 list is a list of already scheduled tasks that are scheduled for the same facility as the task in this iteration of FN1 and which are scheduled in a time slot next to which it is acceptable to schedule the task in this iteration of FN1.

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- P44: GO TO P51 (next FN1.1).
- P45: Is the employee identifier (ID4), job class identifier (ID7) or organizational unit identifier (ID12) that is included in the requirement implementation units for the task in this iteration of FN1 (as determined in P7) also one of the requirement implementation units on the task of this iteration of FN1.1 (as determined in P31)? Yes = P46; No = P43
- P46: Put the ID23 for this iteration of FN1.1 on a temporary list called the P46 list. The P46 list is the list of already scheduled tasks that are scheduled for the same facility and employee, job class or organizational unit as the task in this iteration of FN1 and which are scheduled in a time slot next to which it is acceptable to schedule the task in this iteration of FN1.
- P47: GO TO P51 (next FN1.1).
- P48: Put the ID23 for this iteration of FN1.1 on a temporary list called the P48 list. The P48 list is the list of already scheduled tasks that are scheduled for the same requirement implementation unit(s) as the task in this iteration of FN1 and which are scheduled in a time slot next to which it is acceptable to schedule the task in this iteration of FN1.
- P49: GO TO P51 (next FN1.1).
- P50: Put the ID23 for this iteration for FN1.1 on a temporary list called the P50 list. The P50 list is the list of already scheduled tasks that are scheduled for the same employee, job class or organizational unit as the task in this iteration of FN1 and which are scheduled in a time slot next to which it is acceptable to schedule the task in this iteration of FN1.
- P51: NEXT FN1.1; end of FN1.1, GO TO P52.
- P52: Is the P6 flag an 'A'? Yes = P53; No = P60
- P53: Are there any ID23s on the P40 list? Yes = P54; No = P56
- P54: Change the P6 flag to an 'A1'.
- P55: GO TO P60.
- P56: Are there any ID23s on the P46 list? Yes = P57; No = P59
- P57: Change the P6 flag to an 'A2'.

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P58: Are there any ID23s on the P43 list? Yes = P59; No = P60

P59: Change the P6 flag to an 'A3'.

P60: Determine which list to use in FN1.2. If the P6 flag is an 'A1', use the P40 list; if an 'A2', use the P46 list; if an 'A3', use the P43 list; if a 'B', use the P48 list; if a 'C', use the P50 list.

FN1.2: FOR each ID23 on the list identified in P60:

P61: Locate the DS24 data for the ID23.

P62: Using the DS24 data from P61, identify the time slot information (i.e., the monthly schedule identifier (ID27), date (1-31) and time slot number (a number from '1' to '96' indicating the quarter of an hour period in a day)) for the end time of the scheduling of the task in this iteration of FN1.2.

P63: Put the ID27 identified as a part of the time slot information for the end time identified in P62 on a temporary list called the P63 list.

P64: Locate the DS27 data corresponding to the ID27 identified as a part of the time slot information for the end time identified in P62. Identify the employee identifier (ID4) of the person for whom this set of DS27 data is a monthly schedule and the year and month covered by this set of DS27 data.

FN1.2.1: FOR each ID27 on the DL33 list:

P65: Is the ID27 the same as the ID27 identified in P62? Yes = P71 (next FN1.2.1); No = P66

P66: Locate the DS27 data for the ID27 in this iteration of FN1.2.1. Is this DS27 data for the same OHMIS service area (ID10) as the task in this iteration of FN1 (as determined in P7)? Yes = P67; No = P71 (next FN1.2.1)

P67: Using the DS27 data located in P66, identify the employee identifier (ID4) of the person for whom this is a schedule and the year and month covered by this schedule.

P68: Is the DS27 data from P66 for the same employee identifier (ID4) as that identified in P66? Yes = P69; No = P71 (next FN1.2.1)

P69: Is the DS27 data from P66 for a year and month that is later than the year and month of the DS27 data from P64? Yes = P70; No = P71 (next FN1.2.1)

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- P70: Put the ID27 for this iteration of FN1.2.1 on the P63 list.
- P71: NEXT FN1.2.1; end of FN1.2.1, GO TO P72.
- P72: Using the corresponding DS27 data, put the ID27s on the P63 list in order of ascending year and month. This ordered list is called the P72 list.
- P73: Start a counter, called the P73 counter, with the value '0' in it. This counter will be the count of the number of time slots tentatively scheduled for the task in this iteration of FN1.
- P74: Start a counter, called the P74 counter, with the value '0' in it. This counter will be the count of the number of time slots tentatively scheduled for the task since the last interruption.
- P75: Start a counter, called the P75 counter, with the value '0'. This will be a counter of the number of interruptions in the scheduling of the task in this iteration of FN1 as it is tentatively scheduled.
- FN1.2.2: FOR each ID27 on the P72 list:
- P76: Locate the DS27 data for this ID27.
- FN1.2.2.1: FOR each day (1-31) on the DS27 data from P76:
- P77: Is this date equal to or later than the end date for which the task in this iteration of FN1.2 is scheduled to be completed (as determined in P62)? Yes = P78; No = P107 (next FN1.2.2.1)
- P78: Does the task in this iteration of FN1 have a due date (as determined in P7)? Yes = P79; No = P80
- P79: Is the day in this iteration of FN1.2.2.1 later than the due date for the task in this iteration of FN1 (as determined in P7)? Yes = P15 (next FN1.2); No = P80
- P80: Is the day in this iteration of FN1.2.2.1 equal to one of the days specified on the DS24 data from P2 as being a restricted day (i.e., a day on which the task in this iteration of FN1 cannot be scheduled)? Yes = P107 (next FN1.2.2.1); No = P81
- P81: Does the DS24 data from P2 have a weekly schedule identifier (ID28) specified on it, i.e., an identifier identifying the DS26 data which gives the standard

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restricted times and days of the week for this task (i.e., the standard times of a week that this task cannot be scheduled)? Yes = P82; No = FN1.2.2.1.1 (P85)

P82: Locate the DS26 data for the ID28 on the DS24 data from P2.

P83: Locate the day of the week on the DS26 data from P82 that is the same as the day of the week for this iteration of FN1.2.2.1. (The DS27 data from P76 will indicate the day of the week for each day on the monthly schedule, i.e., the day of the week for this iteration of FN1.2.2.1.)

P84: Does the DS26 data from P82 indicate that the entire day of the week identified in P59 is a restricted day? Yes = P107 (next FN1.2.2.1); No = FN1.2.2.1.1 (P85)

FN1.2.2.1.1: FOR each time slot number (i.e., number from '1' to '96' representing the quarter of an hour time periods in a day) for the day in this iteration of FN1.2.2.1:

P85: Is this time slot later than the time slot identified as the end time for the task in this iteration of FN1.2 (as determined in P62)? Yes = P86; No = P106 (next FN1.2.2.1.1)

P86: According to the DS27 data from P76, is this time slot (i.e., the time slot for this iteration of FN1.2.2.1.1) available for scheduling? Yes = P87; No (i.e., if the time slot in this iteration of FN1.2.2.1.1 is chosen for scheduling the task in FN1, the scheduling will include interruptions in the time set aside for scheduling this task) = P99

P87: According to the DS27 data from P76, is the preferred time use code (CT11) for the time slot in this iteration of FN1.2.2.1.1 the same as the CT11 for the task in this iteration of FN1 (as determined in P7)? Yes = P88; No (i.e., there is an interruption in the time for scheduling the task in this iteration of FN1 if this task is to be scheduled next to the task in this iteration of FN1.2; this interruption is not a break; this interruption is such that the time slot in this iteration of FN1.2.2.1.1 (the interruption) could at the present time or at a later date be filled with another task, i.e., a task different from the task in this iteration of FN1; therefore, it is not desirable to schedule the task in this iteration of FN1 next to the task in this iteration of FN1.2, because it is not desirable to have a task scheduled so as to have the potential for being interrupted by other tasks) = P114

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- P88: Does the DS24 data from P2 contain an ID28 for a set of DS26 data indicating time restriction for the task? Yes = P89; No = P92
- P89: Locate the DS26 data for the ID28 on the DS24 data from P2.
- P90: Locate the day of the week and time slot number on the DS26 data from P89 corresponding to the day of the week for this iteration of FN1.2.2.1 and the time slot for this iteration of FN1.2.2.1.1.
- P91: Does the DS26 data from P89 indicate that the time slot identified in P90 is a restricted time slot, i.e., cannot be used to schedule the task in this iteration of FN1? Yes (i.e., there is an interruption in the time for scheduling the task in this iteration of FN1 if the task is to be scheduled next to the task in this iteration of FN1.2; this interruption is not a break; this interruption is the type the time slot in this iteration of FN1.2.2.1.1 (i.e., the interruption) could at the present time or at a later date be filled with another task, i.e., a task other than the task in this iteration of FN1; therefore, it is not desirable to schedule the task in this iteration of FN1 next to the task in this iteration of FN1.2, because it is not desirable to have tasks scheduled so as to have the potential for being interrupted by other tasks) = P114; No = P92
- P92: According to the DS27 data from P76, is there a task already scheduled for the time slot in this iteration of FN1.2.2.1.1, i.e., a task identifier (ID23) in this time slot on the DS27 data? Yes (i.e., there is an interruption in the time available for scheduling the task in this iteration of FN1 if this task is to be scheduled next to the task in this iteration of FN1.2 because of another task being scheduled, i.e., a task different than the task in this iteration of FN1; therefore, it is not desirable to schedule the task in this iteration of FN1 next to the task in this iteration of FN1.2) = P114; No (i.e., it is possible to tentatively schedule the task in this iteration of FN1 in the time slot in this iteration of FN1.2.2.1.2 as part of scheduling this task next to the task in this iteration of FN1.2) = P93
- P93: Add '1' to the counter in P73 (total time slots tentatively scheduled).
- P94: Add '1' to the counter in P74 (total time slots tentatively scheduled since the last interruption).



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P95: Generate a flag indicating that the last time slot was tentatively scheduled. (Note: This will be used to tell the program whether the next time slot that is an interruption is the beginning of an interruption (if there is a P95 flag) or a continuation of an interruption (if there is no P95 flag)).

P96: Generate or add to a list called the P96 list. Add one set of the following data elements to the list:

- (1) The time slot information for this iteration of FN1.2.2.1.1. The time slot information is the ID27 in this iteration of FN1.2.2, the day (1-31) in this iteration of FN1.2.2.1 and the time slot number (1-96) in this iteration of FN1.2.2.1.1.
- (2) The value in the P73 counter as of this iteration of FN1.2.2.1.1.
- (3) The value in the P74 counter as of this iteration of FN1.2.2.1.1.
- (4) The value in the P75 counter as of this iteration of FN1.2.2.1.1.

P97: Identify the user specified number of time slots required to complete the task in this iteration of FN1 (as determined in P7) and add the number in the P75 counter (number of interruptions) to it. (Note: Each interruption adds one time slot to the time slots required to complete a task.)

P98: Is the value in the P73 counter (number of time slots tentatively scheduled) equal to the value derived in P97? Yes (i.e., enough available time slots have been found to schedule the task in this iteration of FN1 next to the task in this iteration of FN1.2, i.e., the time slots tentatively scheduled for the task in this iteration of FN1 equal the time slots required to complete the task plus the extra time slots allowed for interruptions) = P109; No = P106 (next FN1.2.2.1.1)

P99: (From P86.) Is there a P95 flag (i.e., was the last time slot tentatively scheduled)? Yes (i.e., the time slot in this iteration of FN1.2.2.1.1 is the first time slot in this interruption of the scheduling of the task in this iteration of FN1) = P100; No (i.e., this time slot is a continuation of an interruption) = P115 (next FN1.2.2.1.1)

P100: Erase the P95 flag.

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P101: Is the P74 counter (number of time slots tentatively scheduled since last interruption) equal to '0'; '1' or '2'; or 'greater than 2'? '0' (i.e., no time slots have yet been tentatively scheduled for the task in this iteration of FN1 that are next to the task in this iteration of FN1.2, because the first time slot next to the task in this iteration of FN1.2 was not available for scheduling, i.e., was a break) = P102; '1' or '2' (i.e., less than three time slots have been tentatively scheduled since the last interruption; this is too few time slots to schedule before an interruption; therefore, it is not possible to schedule the task in this iteration of FN1 next to the task in this iteration of FN1.2) = P114; 'greater than 2' = P104

P102: Add '1' to the P75 counter (number of interruptions).

P103: GO TO P106 (next FN1.2.2.1.1).

P104: Identify the number of user specified time slots required to complete the task in this iteration of FN1 (as determined from P7) and add the number in the P75 counter (number of interruptions) to it. (Note: Each interruption adds one time slot to the time required to complete a task.)

P105: Subtract the value currently in the P73 counter (number of time slots tentatively scheduled) from the value derived in P104. Is the remainder less than '3'? Yes (i.e., there is less than three time slots left to schedule for this task and there has been an interruption; this is too few time slots to schedule after an interruption; therefore, it is not possible to schedule the task in this iteration of FN1 next to the task in this iteration of FN1.2) = P114; No = P102

P106: NEXT FN1.2.2.1.1; end of FN1.2.2.1.1, GO TO P107.

P107: NEXT FN1.2.2.1; end of FN1.2.2.1, GO TO P108.

P108: NEXT FN1.2.2; end of FN1.2.2, GO TO P114.

P109: (From P98, i.e., from the point at which it was determined that enough time slots have been tentatively scheduled to fully schedule the task in this iteration of FN1 next to the task in this iteration of FN1.2.) Generate a temporary record, called the P109 temporary record. Put two items on this record:

- (1) The task identifier (ID23) in this iteration of FN1.2 (this is the label for the record); and,

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- (2) The entries (i.e., the sets of four data elements) on the P96 list (i.e., the tentative schedule).

Retain a separate P109 record for each iteration of FN1.2 in which Step P109 is executed, i.e., do not replace the old P109 record, but add a new P109 record throughout the iterations of FN1. The P109 record is called an "option record", because it provides one option for scheduling the task in this iteration of FN1.2. If it is not possible to schedule the task without any interruptions, the options in the P109 records will be reviewed to select the scheduling option with the least number of interruptions (see FN1.3).

- P110: Start a temporary list, called the P110 list, of the labels (ID23s) for the P109 records; or, if P110 has already been reached previously, add to the existing P110 list. Leave space next to each entry (ID23) on this list for a flag indicating that this is the P109 record that should be used for scheduling. Put the ID23 used to label the P109 record generated in this iteration of FN1.2, i.e., the P109 record generated in the last execution of P109, on the bottom (end) of the P110 list. The order of the P110 list is important. It should be in the same order as the order in which the P109 records were generated, i.e., the tasks associated with a P6 flag of 'A1' should come first, then the tasks associated with a P6 flag of 'A2', then 'A3'; or, the task associated with a P6 flag of 'B' and then the task associated with a P6 flag of 'C'. This order ensures that the option records chosen for scheduling (i.e., the FN1.2 task next to which the task in this iteration of FN1 is to be scheduled) is the one most similar to the task in this iteration of FN1.
- P111: Is the value currently in the P75 counter (number of interruptions) equal to '0'? Yes (i.e., the current tentative scheduling of the task is the one that should be used; that is the task in this iteration of FN1 should be scheduled next to the task in this iteration of FN1.2) = P112; No (i.e., the program continues to look for other tasks to schedule the task in this iteration of FN1 next to in order to find tasks that are better, i.e., tasks that do not require any interruptions to schedule the task in this iteration of FN1 next to them) = P114
- P112: Flag the last ID23 on the P110 list (i.e., fill in the blank space next to the ID23) as the ID23 that is the label for the P109 record that is to be used to schedule the task in this iteration of FN1.
- P113: GO TO P136.

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P114: Erase the P96 list, if any.

P115: NEXT FN1.2; end of FN1.2, GO TO P116.

P116: Is the P6 flag an 'A1', 'A2', 'A3', 'B', or a 'C'? A1 = P56; A2 = P58; A3 = P119; B = P117; C = P119

P117: Change the P6 flag to a 'C'.

P118: GO TO P60.

P119: Are there any ID23s on the P110 list? That is, are there any P109 records, i.e., any records giving options for scheduling the task in this iteration of FN1 next to the task in this iteration of FN1.2 where the option would allow for scheduling the task next to a task that is at least in the same facility and may also involve the same requirement implementation units or employee, job class or organizational unit as the task in this iteration of FN1? Yes = P123; No = P120

P120: Is the P6 flag an 'A3' or a 'C'? A3 (i.e., there are no options for scheduling the task in this iteration of FN1 next to a task that is to be conducted in the same facility as the task in this iteration of FN1) = P121; C (i.e., there are no options for scheduling the task in this iteration of FN1 next to a task that has the same employee, job class or organizational unit as a requirement implementation unit as the task in this iteration of FN1; that is, there are no options for scheduling the task in FN1 next to any similar task) = P22

P121: Change the P6 flag to a 'B'.

P122: GO TO P60.

FN1.3: FOR each of the ID23s on the P110 list:

P123: Locate the P109 record for this ID23.

P124: Examine the last entry (i.e., the last set of four data elements) on the P109 record from P123. Identify the value for the fourth data element on this entry. Then, identify the value in the P75 counter (number of interruptions at the time that this task was tentatively scheduled. Is this value a 1? If the scheduling option in the P109 record for this iteration of FN1.3 has the lowest number of interruptions; therefore, the task can be scheduled. This task can be scheduled. GO TO P117

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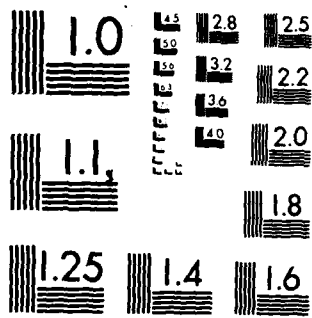
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STEP F4A-6

- P125: Place a flag in the space on the P110 list next to the ID23 in this iteration of FN1.3. The P109 record labeled with this ID23 is to be used for scheduling the task in this iteration of FN1.
- P126: GO TO P136.
- P127: Is the P109 record in this iteration of FN1.3 the first P109 record on the list? Yes = P128; No = P131
- P128: Store the value identified in P124 (i.e., store the number of interruptions in the scheduling option given on the P109 record for this iteration of FN1.3).
- P129: Store the ID123 for this iteration of FN1.3.
- P130: GO TO P134 (next FN1.3).
- P131: Is the value identified in P124 less than the value stored in P129? Yes = P132; No = P134 (next FN1.3)
- P132: Change the value stored in P128 to the value identified in P124.
- P133: Change the ID23 stored in P129 to the ID23 for this iteration of FN1.3.
- P134: NEXT FN1.3; end of FN1.3, GO TO P135.
- P135: Place a flag on the P110 list next to the ID23 that is the same as the ID23 stored in P129. The P109 record labeled with this ID23 is to be used for scheduling the task in this iteration of FN1.
- P136: Identify the ID23 on the P110 list with a flag in it indicating that this is the task next to which the task in this iteration of FN1 is to be scheduled.
- P137: Locate the P109 record for the ID23 from P136. This is referred to as the P137 record. Erase the other P109 records, if any.
- P138: Begin to enter the scheduling information for the task in this iteration of FN1 onto the OHMIS data base. First, complete the DS24 data for the task (i.e., the DS24 data identified in P2). Answer the question of whether the user specified the schedule as 'No'. Answer the question of whether it was possible to schedule the task with a 'Yes'. (Change this answer from its previous 'No' and remove the code explaining why the task had not been scheduled.) For the start time of the task use the first set of time slot information (i.e., the ID27, date (I-3I) and time slot number (1-96)) on the P137 record.

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For the end time use the last set of time slot information on the P137 record. Place the value in the second data element in the last set of time slot information on the P137 record (i.e., the value from the P73 counter (number of time slots scheduled) as the total number of actual time slots scheduled for the task. Place the value for the fourth data element in the last set of time slot information on the P137 record (i.e., the value for the P75 counter (number of interruptions) as of the last time slot scheduled for the task) as the total number of interruptions in the scheduling of the task. Answer the question about whether the task is scheduled to be completed after its due date as 'No'. Answer the question about whether it was possible to schedule the task during the preferred time use as 'Yes'.

- P139: Is the task identifier (ID23) for this iteration of FN1 on the DL31 list? Yes = P140; No = P141
- P140: Remove the ID23 for this iteration of FN1 from the DL31 list.
- P141: Remove the ID23 for this iteration of FN1 from the P1 list.
- P142: Does the task in this iteration of FN1 require a Scheduling Notice (O15) (as determined in P5)? Yes = P143; No = P144
- P143: Use the DS24 data from P2 to generate an O15 output.
- P144: Is the ID23 for this iteration of FN1 on the DL39 list? Yes = P145; No = P146
- P145: Erase the ID23 for this iteration of FN1 from the DL39 list.
- P146: Identify and itemize each of the data entries on the P137 record. A data entry is the equivalent to one entry made in P96, i.e., one set of four data elements. Each such set (entry) of four data elements identifies:
- (1) A particular time slot for which the task in this iteration of FN1 is to be scheduled; this is identified through a monthly schedule identifier (ID27), date (1-31) and time slot number (1-96)).
  - (2) The P73 counter (cumulative number of time slots scheduled) as of the time that the time slot in data element (1) was tentatively scheduled.



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- (3) The P74 counter (number of time slots scheduled since the last interruption) as of the time that the time slot in data element (1) was tentatively scheduled.
- (4) The P75 counter (number of interruptions) as of the time at which the time slot in data element (1) was tentatively scheduled.

FN1.4: FOR each of the data entries on the P137 record (as identified and numbered in P146):

P147: Identify the ID27 contained in data element (1) in the data entry for this iteration of FN1.4.

P148: Locate the DS27 data corresponding to the ID27 from P147.

P149: On the DS27 data located in P148, locate the time slot equivalent to the day (1-31) and time slot number (1-96) contained in data element (1) in the data entry for this iteration of FN1.4.

P150: Fill in the empty fields in the time slot identified in P149 on the DS27 data identified in P148 as follows: The task identifier (ID23) should be the ID23 for this iteration of FN1. The answer to whether this task needs a Scheduling Notice (Q15) is from P5. The time use code (CT11) is from P7. The answer to whether the task was scheduled at the specification of the user is 'No'. The answer as to whether there are any restrictions (and the type of restrictions, i.e., standard, special or both) on the scheduling of this task, the total standard hours for completing this task and the total user specified hours for completing this task are from the DS24 data from P2. The cumulative number of time slots scheduled for this task should be the time slot from the second of the four data elements (i.e., the value for the P73 counter) from the P137 record data entry in this iteration of FN1.4. The cumulative number of interruptions in scheduling the task as of this time slot is from the last of the four data elements (i.e., the value for the P75 counter) from the P137 record data in this iteration of FN1.4. The time slot for the next time slot in which this task is scheduled should be the time slot information (i.e., the first of the four data elements) on the next data entry on the P137 record, i.e., the data entry for the next iteration of FN1.4, if any. If there is none, this value should be left blank.

P151: NEXT FN1.4; end of FN1.4, GO TO P152.

P152: Erase the P137 record. Erase any remaining P109 records.

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P153: NEXT FN1; end of FN1, GO TO P154.

P154: Erase the P1 list.

P155: Are there any ID23s on the P22 list? Yes = P156; No  
(i.e., there are no tasks left to be scheduled) = P157

P156: GO TO P1 of Step F4A-7.

P157. GO TO P17 of Step F4A-2.

OUTPUTS AND GENERATION OF DATA SETS:

015: Scheduling Notices

#### STEP F4A-7

In this Step, the program schedules non-employee transport tasks for which it was not possible (or not necessary) to schedule the task "next to" other already scheduled tasks that will be conducted in the same facility or will involve the same requirement implementation units. The processing for this Step is very similar to that in Step F4A-6 and, therefore, will not be redescribed here. As with Step F4A-5, it may be necessary to allow a task to be scheduled after its due date, if any, if all other scheduling options for the task have failed.

PREVIOUS STEP: Step F4A-7 follows P16 of Step F4A-2 and P156 of Step F4A-6.

## FUNCTION F4B

### Rescheduling Function

(Functional Data Flow)

In this Function the OHMIS program identifies those tasks that need to be rescheduled and makes the necessary changes in the OHMIS data base for rescheduling them. With the exception of the user specified scheduling of tasks (done in Step F4B-7), the actual rescheduling is done in Function F4A in the same way as the original scheduling of the task was done.

There are several different specific reasons why tasks may need to be rescheduled. Each Step of Function F4B identifies the tasks that need to be rescheduled for one of these different reasons. The basic reason why tasks need to be rescheduled is the same, however, in all Steps, namely, that the user makes some change to the OHMIS data base which affects the scheduling of one or more tasks so that they are no longer scheduled appropriately. For example, if the user indicates that a task of the type that in most cases takes two hours is, for this particular task, going to take three hours, this is a change in the data affecting the scheduling of the task and the task will have to be rescheduled. Similarly, if the user indicates that a performer of tasks no longer has a certain time available for scheduling which was formerly shown as available, then the tasks scheduled for that time will need to be rescheduled.

### STEP F4B-1

In this Step the program identifies all of the tasks that need to be rescheduled as a result of a change in the task scheduling restrictions information given on the contact and location data (DS28). It also makes the necessary corresponding changes on the DS27 data.

PREVIOUS STEP: None, initiated by the Menu Selection Sequence shown below.

INPUTS (S = Selection; Q = Query (not stored); E = Entry (stored); R = Retrieval):

#### Menu Selection and Input Sequence:

- S1: 8 (Address data)
- S2: 2 (contact and location data)
- S3: 2 (change task scheduling restrictions data)
- E1: Contact identifier (ID26)
- E2: Answer (Yes/No for whether or not there are any standard restrictions for the identifier for which the user is changing restrictions information. Entry in in P3.)
- E3: Weekly schedule identifier (ID28), i.e., identifier for the weekly schedule data (DS26) containing the new information about restrictions. Entry is in P6.

#### Data Retrievals:

- R1: OHMIS user type (CT1). From P2 of Step F1A-2.
- R2: OHMIS service area identifier (ID10) for the user executing Step F4B-1 at this time. Retained in P5 of Step F1A-2.
- DS24: Specific task scheduling data
- DS26: Regular weekly schedule availability data
- DS27: Monthly schedule data (availability and use)
- DS28: Contact and location data
- DL36: List of requirement implementation units (or sets of units) linked to their corresponding task identifier (ID23), OHMIS service area identifier (ID10) and whether the task is an 'employee transport' type of task

### STEP F4B-1

DL43: List of weekly schedule identifiers (ID28) by contact identifiers (ID26) and by OHMIS service area (ID10)

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

- P1: Ask user for E1 (contact identifier (ID26)) for the particular set of DS28 data for which the user wishes to change scheduling restrictions information.
- P2: Locate the DS28 data corresponding to the ID26 entered in P1.
- P3: Ask the user for E2 (whether or not there are any restrictions). Enter this answer onto the DS28 data located in P2.
- P4: Was the answer given in P3 a 'Yes' or a 'No'? Yes = P6; No = P5
- P5: End of Function F4B; close out and exit to the appropriate Menu '0' (First Level Menu) as determined by the CT1 from R1.
- P6: Ask the user for E3 (regular weekly schedule identifier (ID28)) for the DS26 data containing the information about the restrictions applicable to the identifier for which the DS28 data located in P2 provides contact and location data. Enter this ID28 onto the DS28 data located in P2. Also enter this ID28 and the ID26 from P1 and the ID10 from R2 onto the DL43 list.
- P7: Identify the identifier on the DS28 data located in P2 of the person or thing for which that set of DS28 data provides contact and location data. (Note: This is not the contact person, but the unit about which the DS28 data is providing contact information.)
- P8: Examine the DL36 list and determine if there are any tasks corresponding to the requirement implementation unit identified in P7 and the ID10 from R2. Yes = P9; No = P5
- P9: Generate a temporary list, called the P9 list. Enter the task identifiers (ID23) for all tasks listed on the DL36 list that are for the requirement implementation unit identified in P7 and the ID10 from R2.
- P10: Locate the DS26 data corresponding to the ID28 entered as E2 in P6. Identify the start and end dates of this set of DS26 data.
- FN1: FOR each ID3 on the P9 list:

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- P11: Locate the DS24 data corresponding to the ID23 for this iteration of FN1.
- P12: Does the DS24 data located in P11 show that the task for this iteration of FN1 is currently scheduled? Yes = P13; No = P20 (next FN1)
- P13: Using the DS24 data from P11, identify the time slot information for the start time in which the task in this iteration of FN1 is scheduled to begin.
- P14: Locate the DS27 data corresponding to the monthly schedule identifier (ID27) that is part (1) of the start time slot information identified in P13.
- FN1.1: FOR each of the time slots on the DS27 data from P14 (or succeeding DS27 data sets) on which the task for this iteration of FN1 is currently scheduled, beginning with the time slot identified in P13:
- P15: Locate the time slot on the DS27 data for this iteration of FN1.1. (Note: This is the same as the DS27 data from P14 on the time slot identified in P13, for the first iteration of FN1.1. The information in the P13 time slot and each succeeding time slot will show the next time slot in which the task is scheduled. Therefore, each iteration of FN1.1 involves identifying the next time slot that will constitute the time slot for the next iteration of FN1.1. The next time slot will not necessarily be on the same DS27 data (i.e., will not necessarily have the same ID27), as the preceding one, if the task is scheduled for more than one month.)
- P16: Is the year, month and day of the month for the DS27 time slot located in P15 within the dates covered by the DS26 data located in P10? (Note: The year and month for the DS27 data are given at the top of the DS27 data (a set of DS27 data covers only one month); the date of the month is given as a part of the time slot information for the time slot located in P15. To be "covered" by the DS26 data, the time slot from P15 must be between the start and end dates for the DS26 data as identified in P10.) Yes = P17; No = P19 (next FN1.1)
- P17: Identify the day of the week (1-7) and the time slot number (1-96) on the time slot located in P15. (This information is on the DS27 data.)
- P18: Locate the time slot on the DS26 data from P10 that corresponds to the day of the week and the time slot number identified in P17. Does the DS26 data show that this time slot is restricted (i.e., not available for scheduling)? Yes = P20; No = P19 (next FN1.1)

STEP F4B-1

P19: NEXT FN1.1; end of FN1.1, GO TO P21.

P20: Generate a list called the P21 list and put the ID23 for this iteration of FN1 onto the P20 list; or, if the P20 list already exists (i.e., P20 has already been reached in this execution of Step F4B-1) check the P20 list to determine if the ID23 for this iteration of FN1 is already on the P20 list; if it is, continue; if it is not, add the ID23 to the P20 list and then continue.

P21: NEXT FN1; end of FN1, GO TO P22.

P22: Are there any ID23s on the P20 list? Yes = P23; No = P5

P23: GO TO P1 of Step F4B-2.

OUTPUTS AND GENERATION OF DATA SETS: None



## STEP F4B-2

In this Step, the program modifies the OHMIS data base to reflect the tasks that need to be rescheduled. These tasks have been identified in other Steps of Function F4B.

PREVIOUS STEP: Step F4B-2 follows P23 of Step F4B-1; P33 of Step F4B-3; P16 of Step F4B-4; Step F4B-51; P8 of Step F4B-6; and P26 of Step F4B-7.

INPUTS (R = Retrieval):

Menu Selection and Input Sequence: None

Data Retrievals:

- R1: OHMIS service area identifier (ID10) for the user executing Step F4B-2. From Step F1A-2.
- R2: List of task identifiers (ID23) for the tasks that need to be rescheduled from P19 of Step F4B-1
- R3: List of task identifiers (ID23) for tasks that need to be rescheduled from P1 of Step F4B-3
- R4: List of task identifiers (ID23) for tasks that need to be rescheduled from P1 of Step F4B-4
- R5: List of task identifiers (ID23) for tasks that need to be rescheduled from P1 of Step F4B-5
- R6: List of task identifiers (ID23) for tasks that need to be rescheduled from P1 of Step F4B-6
- R7: List of task identifiers (ID23) for tasks that need to be rescheduled from P1 of Step F4B-7
- DS24: Specific task scheduling data
- DS27: Monthly schedule data (availability and use)
- DL39: List of task identifiers (ID23) for tasks that need to be rescheduled by OHMIS service area (ID10)

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

- P1: Add the R2 through R7 lists together and form one list, called the P1 list.
- FN1: FOR each task identifier (ID23) on the P1 list:
  - P2: Add the ID23 for this iteration of FN1 and the ID10 from R1 to the DL39 list.

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- P3: Locate the DS24 data corresponding to the ID23 for this iteration of FN1.
- P4: Using the DS24 data from P3, identify the time slot information for the start time of the task in this iteration of FN1.
- P5: Locate the DS27 data corresponding to the monthly schedule identifier (ID27) that is part (1) of the time slot information located in P4.
- P6: Change the answer on the DS24 data from P3 as to whether this task is scheduled to be a 'No' and enter the code 'C' (task must be rescheduled) as an explanation for why the task is not scheduled. Also erase all scheduling information from this DS24 data, i.e., the information about the scheduling of the task as it was previously scheduled (e.g., start and end time slot information, whether the task was scheduled before the due date, number of interruptions, etc.). Do not erase the information about whether more than one person will perform this task.
- FN1.1: FOR each time slot in which the task for this iteration of FN1 was previously scheduled beginning with the start time slot identified in P4 and the DS27 data located in P5 and continuing with the time slot identified in P9:
- P7: Locate the time slot for this iteration of FN1.1. (Follow the instructions given in P15 of Step F4B-1.)
- P8: Determine whether the scheduling of the task continues. (This is shown on the DS27 data for the time slot in this iteration of FN1.1 as located in P7.) Yes = P9; No = P12
- P9: Identify the next time slot in which the scheduling of this task continues. (From the DS27 data for the P7 time slot.)
- P10: Erase all of the scheduling information for the task in this iteration of FN1 from the DS27 time slot located in P7.
- P11: NEXT FN1.1. (End of FN1.1 will not be reached.)
- P12: Using the DS24 data from P3, determine if there is more than one person scheduled to perform this task. Yes = P14; No = P13
- P13: GO TO P5 of Step F4B-1.
- P14: Identify the up to 3 monthly schedule identifiers (ID27) on the DS24 data located in P3 that specify the monthly

## STEP F4B-2

schedule data (DS27) on which the scheduling for the task for the additional persons scheduled to perform the task is shown to start. Put the starting DS27s on a temporary list, called the P14 list.

FN1.2: FOR each ID27 on the P14 list:

P15: Locate the DS27 data corresponding to the ID27 for this iteration of FN1.2.

FN1.2.1: FOR each time slot in which the task in this iteration of FN1 is already scheduled and is, therefore, also scheduled for an additional person to perform the task at the same time, beginning with the date of the month and the time slot number that are parts (2) and (3) of the start time slot identified in P4 on the DS27 data located in P15 and continuing with the time slot identified in P18.

P16: Locate the time slot for this iteration of FN1.2.1.  
(Following the instructions given in P15 of Step F4B-1.)

P17: Determine whether the scheduling of the task continues to another time slot. (This information is shown on the DS27 data for the time slot for this iteration of FN1.2.1 as located in P16.) Yes = P18; No = P21 (next FN1.2)

P18: Identify the next time slot in which the scheduling of this task will continue. (From the DS27 data for the P16 time slot.)

P19: Erase all of the scheduling information for the task in this iteration of FN1 from the DS27 data time slot located in P16.

P20: NEXT FN1.2.1. (End of FN1.2.1 will not be reached.)

P21: NEXT FN1.2; end of FN1.2, GO TO P22.

P22: Change the answer to the question on the DS24 data located in P3 about whether there are additional persons scheduled to perform this task to be 'No'. Erase the information about the additional persons previously scheduled to perform this task shown on the DS24 data.

P23: GO TO P13.

OUTPUTS AND GENERATION OF DATA SETS: None

### STEP F4B-3

In this Step, the program identifies the tasks that need to be rescheduled due to the deactivation of regular weekly availability data (DS26). The program also identifies and erases the monthly schedule data (DS27) that should be erased as a result of the DS26 data being deactivated.

PREVIOUS STEP: None, initiated by the Menu Selection Sequence shown below.

INPUTS (S = Selection; Q = Query (not stored); E = Entry (stored); R = Retrieval):

#### Menu Selection and Input Sequence:

- S1: 7 (scheduling data)
- S2: 2 (regular weekly schedule data)
- S3: 2 (deactivate regular weekly schedule data)
- Q1: Weekly schedule identifier (ID28) for the weekly schedule data (DS26) the user wishes to deactivate. Query is in P2.
- E1: Deactivation date. Entry is in P4.

#### Data Retrievals:

- R1: OHMIS service area identifier (ID10) for the user executing Step F4B-3. From P5 of Step F1A-2.
- DS26: Regular weekly schedule availability data
- DS27: Monthly schedule data (availability and use)
- DL33: List of monthly schedule identifiers (ID27) by OHMIS service area (ID10)
- DL41: List of monthly schedule identifiers (ID27) for an OHMIS service area (ID10) with the corresponding year and month covered by the monthly schedule data (DS27) identified by the ID27 and the employee identifier (ID4) of the employee performing the tasks scheduled on this DS27 data

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

- P1: Start a list, called the P1 list. This will be a list of the task identifier (ID23) for the tasks that need to be rescheduled.

STEP F4B-3

- P2: Ask the user for Q1 (weekly schedule identifier (ID28)) of the DS26 data he/she wishes to deactivate.
- P3: Locate the DS26 data corresponding to the ID28 from P2.
- P4: Ask the user for E1 (deactivation date). Enter this date on the DS26 data located in P3.
- P5: Identify the employee identifier (ID4) on the DS26 data from P3 that is a person for whom the DS26 data provides weekly schedule availability data.
- P6: Determine if there are any entries on the DL41 list for the employee identifier from P5 and for the year and month equal to later than the year and month of the date entered in P4. Yes = P8; No = P7
- P7: GO TO P5 of Step F4B-1.
- P8: Identify the entries (ID27s) on the DL41 list that are for the ID4 from P5 and are for the year and month equal to or later than the year and month from P4. Put these monthly schedule identifiers (ID27) on a temporary list called the P8 list.

FN1: FOR each ID27 on the P8 list:

- P9: Locate the DS27 data corresponding to the ID27 for this iteration of FN1.
- P10: Identify the year and month covered by the DS27 data from P9. (This information is on the DS27 data.) Is this the same year and month as the date entered in P4? Yes = FN1.1 (P11); No = FN1.2 (P20)
- FN1.1: FOR each day of the month on the DS27 data located in P9:
- P11: Is the day of the month for this iteration of FN1.1 equal to or later than the day of the month for the date entered in P4? Yes = P12; No = P19 (next FN1.1)
- P12: Is the answer for the question about availability for scheduling for the entire day of the month for this iteration of FN1.1 on the DS27 data from P9 a 'Yes' or 'No'? Yes = P13; No = P19 (next FN1.1)
- P13: Enter the answer 'No' for the question about the availability for scheduling for the entire day for the day of the month in this iteration of FN1.1 onto the DS27 data from P9.

STEP F4B-3

FN1.1.1: FOR each time slot (1-96) on the day of the month for this iteration of FN1.1:

P14: Locate the time slot for this iteration of FN1.1 on the DS27 data from P9.

P15: Enter the answer 'No' for the question about availability for scheduling for the time slot located in P14.

P16: Is there a task scheduled in the time slot for this iteration of FN1.1.1? Yes = P17; No = P18 (next FN1.1.1)

P17: Identify the task identifier (ID23) for the task scheduled in the time slot for this iteration of FN1.1.1. Check the P1 list to determine if this ID23 is already on the P1 list. If 'No', add this ID23 to the P1 list and continue; if 'Yes', just continue.

P18: NEXT FN1.1.1; end of FN1.1.1, GO TO P19.

P19: NEXT FN1.1; end of FN1.1, GO TO P31 (next FN1).

FN1.2: FOR each day of the month on the DS27 data located in P9:

P20: Is the answer for the question about the availability for scheduling for the entire day for this iteration of FN1.2 on the DS27 data from P9 a 'Yes' or 'No'? Yes = FN1.2.1 (P21); No = P27 (next FN1.2)

FN1.2.1: FOR each time slot (1-96) on the day of the month for this iteration of FN1.2:

P21: Locate the time slot for this iteration of FN1.2.1 on the DS27 data from P9.

P22: Is there a task scheduled in the time slot for this iteration of FN1.2.1? Yes = P23; No = P26 (next FN1.2.1)

P23: Identify the task identifier (ID23) for the task that is scheduled in the time slot for this iteration of FN1.2.1.

P24: Is the ID23 identified in P23 already on the P1 list? Yes = P26; No = P25

P25: Add the ID23 identified in P23 to the P1 list.

P26: NEXT FN1.2.1, end of FN1.2.1, GO TO P27.

P27: NEXT FN1.2, end of FN1.2, GO TO P28.

P28: Erase the DS27 data located in P9.

STEP F4B-3

P29: Erase the entire entry for the ID27 from this iteration of FN1 from the DL33 list.

P30: Erase the entire entry for the ID27 for this iteration of FN1 from the DL41 list.

P31: NEXT FN1; end of FN1, GO TO P32.

P32: Are there any entries on the P1 list? Yes = P33; No = P7

P33: GO TO P1 of Step F4B-2.

OUTPUTS AND GENERATION OF DATA SETS: None

#### STEP F4B-4

In this Step, the program identifies the tasks that need to be rescheduled because of a change in the restrictions or availability for scheduling data on the regular weekly schedule data (DS26). It also makes the necessary changes on the DS27 data. It also allows the user to enter changes in preferred time use (CT11) on the DS26 data and makes the corresponding changes on the DS27 data and, if necessary, on the DS24 data.

PREVIOUS STEP: None, initiated by the Menu Selection Sequence shown below.

INPUTS (S = Selection; Q = Query (not stored); E = Entry (stored); R = Retrieval):

##### Menu Selection and Input Sequence:

- S1: 7 (scheduling data)
- S2: 2 (regular weekly schedule data)
- S3: 3 (change regular weekly schedule data)
- Q1: Weekly schedule identifier (ID26) of the regular weekly schedule data (DS28) that the user wishes to change. Query is in P2.
- Q2: Day of the week (1-7) that the user wishes to change. Query is in P4.
- Q3: Whether the user wishes to change availability information or preferred time use (CT11) information. Query is in P5.
- E1: Whether the user wishes to enter that the entire day is not available for scheduling. Query is in P6.
- Q4: Time slot number (1-96) that the user wishes to change. Query is in P9 and P61.
- E2: Whether time slot is available for scheduling. Answers: Yes/No. Entry is in P10.
- E3: Preferred time use code (CT11) for the time slot. Entry is in P63.

##### Data Retrievals:

- R1: OHMIS service area identifier (ID10) for the user executing Step F4B-4. Retained in P5 of Step F1A-2.
- DS24: Specific task scheduling data



#### STEP F4B-4

- DS26: Regular weekly schedule availability data
- DS27: Monthly schedule data (availability and use)
- DS28: Contact and location data
- DL36: List of requirement implementation units (or sets of units) linked to their corresponding task identifier (ID23), OHMIS service identifier (ID10) and whether the task is an 'employee transport' type of task
- DL41: List of the monthly schedule identifiers (ID27) for an OHMIS service area (ID10) with the corresponding month and year covered by the monthly schedule data (DS27) identified by the ID27 and the employee identifier (ID4) of the employee performing the tasks scheduled on this DS27 data
- DL43: List of weekly schedule identifiers (ID28) by contact identifier (ID26) and by OHMIS service area (ID10)

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

- P1: Start a list, called the P1 list, of task identifiers (ID23) for the task that will need to be rescheduled.
- P2: Ask the user for query (weekly schedule identifier (ID28)) of the DS26 data that the user wishes to change.
- P3: Locate the DS26 data with the ID28 from P2. Identify the start and end dates of this set of DS26 data.
- P4: Ask the user for Q2 (day of the week (1-7) that the user wishes to change).
- P5: Ask the user for Q3 (whether user wishes to change availability information or preferred time use code (CT11)). Availability information = P6; CT11 = P16
- P6: Ask the user for E1 (whether any of the time slots on the day of the week obtained in P4 are to be available for scheduling). Yes = P9; No = P7 (Note: Retain this answer throughout Step F4B-4.)
- P7: Enter the answer 'No' to the question about availability for scheduling for the day of the week obtained in P4 on the DS26 data from P3. Also enter the answer of 'No' for the question as to whether the time slot is available for scheduling onto each of the time slots on the DS26 data from P3 for the day of the week from P4.

STEP F4B-4

- P8: Is the DS26 data from P3 restricted times type of DS26 data? Yes = P20; No = P37
- P9: Ask the user for Q4 (time slot number (1-96) that the user wishes to change).
- P10: Ask user for E2 (whether the time slot is available for scheduling). Answers: Yes/No
- P11: Locate the time slot on the DS26 data from P3 that is for the day of the week from P4 and the time slot number from P9. Enter the answer given in P10 onto the DS26 data for the question about the availability for scheduling for this time slot.
- P12: Is the DS26 data from P3 restricted times type of DS26 data? Yes = P13; No = P37
- P13: Was the answer given in P10 a 'Yes' or a 'No'? Yes = P14; No = P18
- P14: Ask the user for Q5 (whether the user has more changes). Yes = P4; No = P15
- P15: Are there any entries (ID23s) on the P1 list? Yes = P16; No = P17
- P16: GO TO P1 of Step F4B-2.
- P17: GO TO P5 of Step F4B-1.
- P18: Check whether there are any time slots on the DS26 data from P3 for the day of the week from P4 that have an answer of 'Yes'. Yes = P20; No = P19
- P19: Enter the answer 'No' for the answer to the question about availability for scheduling in the field corresponding to the day of the week from P4 onto the DS26 data from P3.
- P20: Are there any entries (i.e., contact identifiers (ID26)) on the DS43 list for the ID28 entered in P2 and the ID10 from R1? Yes = P21; No = P14
- P21: Identify each of the ID26s on the DS43 list for the ID28 from P2 and the ID10 from R1. Enter onto a temporary list, called the P21 list.
- FN1: FOR each ID26 on the P21 list:
- P22: Locate the DS28 data corresponding to this ID26.

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P23: Identify the identifier of the person or thing for which the DS28 data from P22 provides contact and location data. (Note: This is not the contact person (ID4) given on the DS28 data, but the person or thing about which the DS28 data provides contact information.)

P24: Examine the DL36 list and determine if there are any tasks corresponding to the requirement implementation unit identifier identified in P23 and the ID10 from R1. Yes = P25; No = P36 (next FN1)

P25: Generate a temporary list, called the P25 list. Enter the task identifiers (ID23) for all tasks listed on the DL36 list that are for the requirement implementation unit identified in P3 and the ID10 from R1 onto the P25 list.

FN1.1: FOR each ID23 on the P20 list:

P26: Locate the DS24 data corresponding to the ID23 for this iteration of FN1.1.

P27: Does the DS24 data located in P26 show that the task for this iteration of FN1.1 is currently scheduled? Yes = P28; No = P35 (next FN1.1)

P28: Using the DS24 data from P26, identify the time slot information for the time slot in which the task in this iteration of FN1.1 is scheduled to start.

P29: Locate the DS27 data corresponding to the monthly schedule identifier (ID27) that is part (1) of the start time slot information identified in P28.

FN1.1.1: FOR each time slot on the DS27 data from P29 (or succeeding DS27 data sets) on which the task in this iteration of FN1.1 is currently scheduled, beginning with the start time slot identified in P28 and the DS27 data from P29:

P30: Locate the time slot for this iteration of FN1.1.1. (Follow the instructions given in P15 of Step F4B-1.)

P31: Is the year, month and day of the month for the DS27 time slot located in P30 within the dates covered by the DS26 data located in P3? Yes = P32; No = P33 (next FN1.1.1)

P32: Identify the time slot on the DS26 data from P3 that is the same time slot (i.e., the same day of the week and time slot number) as that located on the DS27 data in P30. Does this DS26 time slot indicate that the time slot is available for scheduling? Yes = P33 (next FN1.1.1); No = P34

STEP F4B-4

- P33: NEXT FN1.1.1; end of FN1.1.1, GO TO P35.
- P34: Check the P1 to determine if the ID23 for this iteration of FN1.1 is already on the P1 list; if not, put the ID23 on the P1 list and continue; otherwise, just continue.
- P35: NEXT FN1.1; end of FN1.1, GO TO P36.
- P36: NEXT FN1; end of FN1, GO TO P14.
- P37: (From P8 and P12): Identify the employee identifier (ID4) on the DS26 data from P3 of the person for whom this set of DS26 data provides weekly schedule availability data.
- P38: Determine if there are any entries (ID27) on the DL41 list for the ID4 from P37 and the ID10 from R1. Yes = P39; No = P14
- P39: Identify each of the ID27s on the DL41 list for the ID4 from P37 and the ID10 from R1. Enter onto a temporary list, called the P39 list.
- FN2: FOR each of the ID27s on the P39 list:
- P40: Locate the DS27 data corresponding to the ID27 for this iteration of FN2.
- FN2.1: FOR each of the days of the month on the DS27 data located in P40 (or for the day of the month identified in P48, if one has been identified):
- P41: Identify the day of the week for the day of the month in this iteration of FN2.1 (as shown on the DS27 data). Is this day of the week the same as the day of the week from P4? Yes = P42; No = P59 (next FN2.1)
- P42: Was the answer to the question in P6 a 'Yes' or a 'No'? Yes = P43; No = FN2.1.1 (P55)
- P43: Identify the time slot (1-96) on the DS27 data from P40 and for the day of the month for this iteration of FN2.1 that is the same as the time slot entered in P9.
- P44: Was the answer given in P10 a 'Yes' or a 'No'? Yes = P45; No = P50
- P45: Fill the question about availability for scheduling on the DS27 data from P40 for the time slot identified in P43 with the answer 'Yes'.
- P46: Derive the sum that is equal to the day of the month for this iteration of FN2.1, plus '7'.

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- P47: Is there a day of the month on the DS27 data from P40 that is equal to the value derived in P46? (Note: To answer this question, examine the last day of the month on the DS27 data and determine if it is less than the value derived in P46.) Yes = P48; No = P60 (next FN2)
- P48: Identify the day of the month on the DS27 data from P4 with the value derived in P46. Store this date.
- P49: Is the answer to the question in P42 a 'Yes' or a 'No'? Yes = P59 (next FN2); No = P54
- P50: Is there a task scheduled in the time slot identified in P43? Yes = P51; No = P52
- P51: Identify the task identifier (ID23) for the task that is scheduled in the time slot identified in P43. Check the P1 list to determine if this ID23 is already on the P1 list; if not, place this ID23 on the P1 list and continue; if it is, simply continue.
- P52: Fill the question about availability for scheduling on the DS27 data from P40 for the time slot identified in P43 with the answer 'No'.
- P53: GO TO P46.
- P54: Generate a flag, called the P54 flag (if such a flag has not already been generated).
- FN2.1.1: FOR each time slot (1-96) on the day of the month for this iteration of FN2.1 (or the time slot identified in P48 if there is a flag in P54), for the DS27 data located in P40:
- P55: Fill in the answer to the question about availability for scheduling for the time slot in this iteration of FN2.1.1 with the answer 'No'.
- P56: Is there a task scheduled in the time slot for this iteration of FN2.1.1? Yes = P57; No = P58 (next FN2.1.1)
- P57: Identify the task identifier (ID23) for the task that is scheduled in the time slot for this iteration of FN2.1.1. Check to determine if this ID23 is already on the P1 list; if not, enter it on the P1 list and continue; otherwise, simply continue.
- P58: NEXT FN2.1.1; end of FN2.1.1, GO TO P46.
- P59: NEXT FN2.1 end of FN2.1, GO TO P60.

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P60: NEXT FN2; end of FN2, GO TO P14.

P61: (From P5): Ask user for Q4 (time slot number (1-96) that the user wishes to change).

P62: Ask the user for E3 (new preferred time use code (CT11)) for the time slot identified in P61.

P63: Locate the time slot entered in P61 on the DS26 data from P3. Enter the CT11 from P62 onto the appropriate field for this time slot.

P64: Identify the employee identifier (ID4) on the DS26 data from P3 for the person for whom this set of DS26 data provides weekly schedule availability data.

P65: Determine if there are any entries (ID27s) on the DL41 list for the ID4 from P64 and the ID10 from R1. Yes = P66; No = P14

P66: Identify each of the ID27s on the DL41 list for the ID4 from P64 and the ID10 from R1. Put on a temporary list called the P66 list.

FN3: FOR each of the ID27s on the P66 list:

P67: Locate the DS27 data corresponding to the ID27 for this iteration of FN3.

FN3.1: FOR each day of the month on the DS27 data from P67 (or the day of the month identified in P88, if any):

P68: Identify the day of the week for this day of the month. Is it the same as the day of the week from P4? Yes = P69; No = P89 (next FN3.1)

P69: Identify the time slot (1-96) on the DS27 data from P67 for the day of the month for this iteration of FN3.1 that is the same as the time slot entered in P61.

P70: Identify the current preferred time use code (CT11) for the time slot identified in P69 as shown on the DS27 data located in P67 for the time slot. Store this CT11.

P71: Fill in the time slot identified in P69 on the DS27 data from P67 for the question about preferred time use with the CT11 code entered in P62.

P72: Is there a task currently scheduled in the time slot identified in P69? Yes = P73; No = P86

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- P73: Identify the task identifier (ID23) for the task that is scheduled in the time slot identified in P69.
- P74: Locate the DS24 data corresponding to the ID23 from P73.
- P75: Is the current answer shown on the DS24 data from P74 to the question as to whether all of the time slots for the tasks identified in P73 are scheduled in the correct time use code a 'Yes' or 'No'? Yes = P76; No = P78
- P76: Enter the answer 'No' on the DS24 data from P74 for the question as to whether the task is scheduled in the correct time use.
- P77: GO TO P86.
- P78: Using the DS24 data from P74, identify the time use code (CT11) for the task (not the time slot) identified in P73. Is this time use code the same as the time use code from P70 (i.e., was this time slot previously scheduled in the correct preferred time use)? Yes = P86; No = P79
- P79: Is the time use code (CT11) identified in P78 the same as the CT11 entered in P62? Yes = P80; No = P86
- P80: Using the DS24 data from P74, identify the time slot information for the start time of the task identified in P73.
- P81: Locate the DS27 data corresponding to the monthly schedule identifier (ID27) that is part (1) of the time slot information located in P80.
- FN3.1.1: FOR each time slot in which the task identified in P73 is currently scheduled, beginning with the start time slot identified in P80 and the DS27 data from P81:
- P82: Locate the time slot for this iteration of FN3.1.1. (Follow the instructions in P15 of Step F4B-1.)
- P83: Using the DS27 data for this iteration of FN3.1.1, determine if the time slot for this iteration of FN3.1.1 was scheduled in the correct preferred time use. Yes = P84; No = P86
- P84: NEXT FN3.1.1, end of FN3.1.1, GO TO P85.
- P85: Enter the answer 'Yes' on the DS24 data from P74 for the question as to whether the task identified in P73 is scheduled in the correct time use.

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- P86: Derive the sum that is equal to the day of the month for this iteration of FN3.1, plus '7'.
- P87: Is there a day of the month on the DS27 data from P67 that is equal to the value derived in P86? Yes = P88; No = P90 (next FN3)
- P88: Identify the day of the month on the DS27 data from P67 with the value derived in P86. Store this date.
- P89: NEXT FN3.1, end of FN3.1, GO TO P90.
- P90: NEXT FN3; end of FN3, GO TO P14.

OUTPUTS AND GENERATION OF DATA SETS: None



#### STEP F4B-5

In this Step, the program identifies the tasks that need to be rescheduled due to a change in the availability for scheduling information given on the monthly schedule data (DS27). It also allows the user to enter changes in preferred time use (CT11) on the DS27 data.

PREVIOUS STEP: None; initiated by the Menu Selection Sequence shown below.

INPUTS (S = Selection; Q = Query (not stored); E = Entry (stored); R = Retrieval):

##### Menu Selection and Input Sequence:

- S1: 7 (scheduling data)
- S2: 3 (monthly schedule data)
- S3: 2 (change monthly schedule data)
- Q1: Monthly schedule identifier (ID27) for the monthly schedule data (DS27) that the user wishes to change. Query is in P2.
- Q2: Day of the month (1-31) that the user wishes to change. Query is in P4.
- Q3: Whether the user wishes to change scheduling availability information or preferred time use information. Query is in P5.
- E1: Whether an entire day has any time slots available for scheduling. Entry is in P7.
- Q4: Time slot number (1-96) that user wishes to change. Query is in P9 and P30.
- E2: Whether the time slot is available for scheduling. Entry is in P11.
- E3: Preferred time use code (CT11). Entry is in P34.

##### Data Retrievals:

- R1: OHMIS service area identifier (ID10) for the user executing Step F4B-5. From P5 of Step F1A-2.
- DS24: Specific task scheduling data
- DS27: Monthly schedule data (availability and use)

STEP F4B-5

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

- P1: Start a list, called the P1 list. This will be a list of the task identifier (ID23) for the tasks that need to be rescheduled.
- P2: Ask the user for Q1 (monthly schedule identifier (ID27) for the DS27 data that the user wishes to change).
- P3: Locate the DS27 data corresponding to the ID27 entered in P2.
- P4: Ask user for Q2 (day of the month (1-31) that the user wishes to change).
- P5: Ask user for Q3 (whether user wishes to change availability information or the preferred time use (CT11) code). Availability information = P6; CT11 = P30
- P6: Ask user for E1 (whether any of the time slots on the day of the month entered in P4 are to be available for scheduling). Yes = P7; No = P9
- P7: Enter the answer 'No' in the field corresponding to the day of the month obtained in P4 on the DS27 data from P3 for the question as to whether the entire day has any time available for scheduling. Also enter the answer 'No' for the question about whether the time slot is available for scheduling in each of the time slots on the DS27 data from P3 for the day of the month from P4.
- P8: GO TO FN1 (P24).
- P9: Ask the user for Q4 (time slot number (1-96) that the user wishes to change).
- P10: Ask user for E2 (whether the time slot is available for scheduling). Answers: Yes/No
- P11: Locate the time slot on the DS27 data from P3 that is for the day of the month from P4 and the time slot number from P9. Enter the answer given in P10 onto the DS27 data for the question about availability for scheduling for this time slot.
- P12: Was the answer given in P10 a 'Yes' or a 'No'? Yes = P13; No = P17
- P13: Ask the user for Q5 (whether the user has more changes to this set of DS27 data). Yes = P4; No = P14

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- P14: Are there any entries (ID23s) on the P1 list? Yes = P15;  
No = P16
- P15: GO TO P1 of Step F4B-2.
- P16: GO TO P5 of Step F4B-1.
- P17: Check whether there are any time slots on the DS27 data from P3 for the day of the month from P4 that have an answer of 'Yes'. Yes = P19; No = P18
- P18: Enter the answer 'No' for the question about availability for scheduling in the field corresponding to the day of the month from P4 on the DS27 data from P3.
- P19: Does the DS27 data from P3 indicate that the time slot located in P11 currently has a task scheduled it? Yes = P20; No = P13
- P20: Identify the task identifier (ID23) for the task scheduled in the time slot located in P11.
- P21: Is the ID23 from P20 already on the P1 list? Yes = P13; No = P22
- P22: Add the ID23 from P20 to the P1 list.
- P23: GO TO P13.
- FN1: FOR each time slot (1-96) on the DS27 data from P3 for the day of the month located in P4:
- P24: Locate the time slot corresponding to this iteration of FN1.
- P25: Does the DS27 data from P3 indicate that the time slot located in P24 currently has a task scheduled in it? Yes = P26; No = P29 (next FN1)
- P26: Identify the task identifier (ID23) of the task scheduled in the time slot located in P24.
- P27: Is the ID23 from P26 already on the P1 list? Yes = P29 (next FN1); No = P28
- P28: Add the ID23 from P26 to the P1 list.
- P29: NEXT FN1; end of FN1, GO TO P13.
- P30: (From P5): Ask the user for Q4 (time slot number (1-96) that the user wishes to change).

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- P31: Ask the user for E3 (new preferred time use code (CT11)).
- P32: Locate the time slot entered in P30 on the DS27 data from P3.
- P33: Identify the current preferred time use code (CT11) for the time slot located in P32 as shown on the DS27 data for this time slot. Store this value.
- P34: Enter the CT11 from P31 onto the appropriate field for this time slot.
- P35: Is there a task currently scheduled in the time slot identified in P30? Yes = P36; No = P13
- P36: Identify the task identifier (ID23) for the task that is scheduled in the time slot identified in P30.
- P37: Locate the DS24 data corresponding to the ID23 from P36.
- P38: Is the current answer shown on the DS24 data from P37 to the question as to whether all of the time slots for the task identified in P36 are scheduled in the correct time use code a 'Yes' or a 'No'? Yes = P39; No = P41
- P39: Enter the answer 'No' on the DS24 data on P37 for the question as to whether the task is scheduled in correct time use.
- P40: GO TO P13.
- P41: Using the DS24 data from P37, identify the time use code (CT11) for the task (not the time slot) identified in P30. Is this CT11 the same as the same CT11 identified in P33? Yes = P13; No = P42
- P42: Is the CT11 identified in P41 the same as the CT11 identified in P31? Yes = P43; No = P13
- P43: Using the DS24 data from P37, identify the time slot information for the start time slot of the task identified in P36.
- P44: Locate the DS27 data corresponding to the monthly schedule identifier (ID27) that is part (1) of the time slot information located in P43. (Note: This will not necessarily be the same as the DS27 data located in P3, if the task identified in P36 is scheduled for days involving more than one month.)

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FN2: FOR each time slot in which the task identified in P36 is currently scheduled, beginning with the start time slot identified in P43 and the DS27 data from P44:

P45: Locate the time slot for this iteration of FN2. (Follow the instructions in P15 of Step F4B-1.)

P46: Using the DS27 data for this iteration of FN2, determine if the time slot for this iteration FN2 was scheduled in the correct preferred time use. Yes = P47; No = P13

P47: NEXT FN2; end of FN2, GO TO P48.

P48: Enter the answer 'Yes' onto the DS24 data from P37 for the question as to whether the task identified in P36 is scheduled in the correct time use.

P49: GO TO P13.

OUTPUTS AND GENERATION OF DATA SETS: None

#### STEP F4B-6

In this Step, the program allows the user to enter changes to the specific task scheduling data (DS24) and determines whether that task described on the DS24 data needs to be rescheduled because of the changes made to the DS24 data. The program also makes the changes to the monthly schedule data (DS27) corresponding to the changes made on the DS24 data

PREVIOUS STEP: None; initiated by the Menu Selection Sequence shown below.

INPUTS (S = Selection; Q = Query (not stored); E = Entry (stored); R = Retrieval):

##### Menu Selection and Input Sequence:

- S1: 7 (scheduling data)
- S2: 4 (specific task scheduling data)
- S3: 1 (change selected items on the specific task scheduling data)
- Q1: Task identifier (ID23) for the task that the user wishes to change. Query is in P2.
- Q2: The data element that the user wishes to change. Query is in P4.
- Q3: Whether user wishes to make any additional changes. Query is in P6.
- E1: Entry of changes to one of the five data elements the changes to which do not affect the scheduling to the task (see P4). Query is in P5.
- E2: New number of user specified time slots required to complete the task. Entry is in P12.
- Q4: Whether the user wishes to add, delete or change the special restrictions dates for the scheduling of the task. Query is in P66.
- Q5: Which (number from '1' to '3') of the special restrictions dates already listed on the DS24 data the user would like to change or delete. Query is in P67 and P96.
- E3: New special restrictions date or range of special restrictions dates. Query is in P74 and P97.

##### Data Retrievals:

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DS24: Specific task scheduling data

DS27: Monthly schedule data (availability and use)

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

- P1: Start a list, called the P1 list. This list will contain the one task identifier (ID23) for the task that is being changed in Step F4B-6 (i.e., the ID23 from P2), if the changes made to the DS24 data as a part of Step F4B-6 result in the need to reschedule the task.
- P2: Ask the user for Q1 (task identifier (ID23) of the task that the user wishes to change).
- P3: Locate the DS24 data corresponding to the ID23 from P2.
- P4: Ask the user for Q2 (what part of the task data (DS24) the user wishes to change). Supplement to the detailed description of the task = P5; Supplement to the description of the task given on the Scheduling Notice (015) = P5; Supplement to the description given to a participant in the task = P5; Supplement to the description of the preparation for the task = P5; Facility identifier (ID8) for the task = P5; User specified number of time slots = P10; Erase the weekly schedule identifier (ID28) identifying standard restrictions for scheduling the task = P54; Additions or changes to the restricted dates, i.e., to the special restrictions = P66
- P5: Ask user for E1 (i.e., the new (changed) information on the data element selected in P4. Enter this new information onto the DS24 data located in P3.
- P6: Ask the user for Q3 (whether the user wishes to make any additional changes to this task). Yes = P4; No = P7
- P7: Are there any entries on the P1 list? Yes = P8; No = P9
- P8: GO TO P1 of Step F4B-2.
- P9: GO TO P5 of Step F4B-1.
- P10: Ask the user for E2 (new number of user specified time slots required to complete the task).
- P11: Is the task identified in P2 shown to be currently scheduled? Yes = P14; No = P12
- P12: Enter the value from P10 onto the DS24 data located in P3 for the field for the user specified number of required time slots to complete the task.

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- P13: GO TO P6.
- P14: Identify the current value for a number of user specified time slots on the DS24 data from P3. (Note: This value is the same as the standard required time slots, if the user has not previously specified the time slots required to complete the task for this value.)
- P15: Put the new user specified required number of time slots (from P10) onto the DS24 data from P3.
- P16: Is the value in P10 less than or greater than the value in P14. Less than = P20; Greater than = P17
- P17: Determine if the ID23 from P2 is already on the P1 list. Yes = P6; No = P18
- P18: Put the ID23 from P2 onto the P1 list.
- P19: GO TO P6.
- P20: Using the DS24 data from P3, identify the time slot information for the start time slot in which the task is scheduled.
- P21: Locate the DS27 data corresponding to the monthly schedule identifier (ID27) in part (1) of the start time slot identified in P20.
- FN1: FOR each time slot in which the task from P2 is currently scheduled, beginning with the start time slot identified in P20 in the DS27 data located in P21:
- P22: Locate the time slot for this iteration of FN1. (Follow the instructions given in P15 of Step F4B-1.)
- P23: Using the DS27 data for this iteration of FN1, identify the cumulative number of time slots scheduled for the task as of the time slot for this iteration of FN1.
- P24: Using the DS27 data for this iteration of FN1, identify the cumulative number of interruptions as of the time slot for this iteration of FN1.
- P25: Derive the value that is equal to the value from P23 minus the value from P24.
- P26: Is the value derived in P25 equal to the value specified in P10? Yes = P28; No = P27 (next FN1)
- P27: NEXT FN1. (Note: The end of FN1 will never be reached.)



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- P28: Store the value obtained in P23 for the last iteration of FN1.
- P29: Enter the value from P24 from the last iteration of FN1 onto the DS24 data located in P3 as the total number of interruptions in the scheduling of the task.
- P30: Store the time slot information (i.e., ID27, date and time slot number) for the time slot reached in the last iteration of FN1.
- P31: Place the time slot information stored in P30 onto the DS24 data located in P3 as the end time slot for the scheduling of the task.
- P32: Determine if there is a due date for the task identified in P2. This is shown on the DS24 data from P3. Yes = P33; No = FN2 (P38)
- P33: Identify the due date for the task identified in P2 as shown on the DS24 data from P3.
- P34: Is the date identified in P3 later than the date stored in P30? Yes = FN2 (P38); No = P35
- P35: Enter the answer 'Yes' on the DS24 data from P3 for the question as to whether the task was scheduled after the due date.
- P36: Skip this step.
- P37: Skip this step.
- FN2: FOR each time slot in which the task from P2 is currently scheduled, beginning with the start time slot identified in P20 and the DS27 data located in P21:
- P38: Locate the time slot for this iteration of FN2. (Follow the instructions given in P15 of Step F4B-1. Use the time slot information identified in P41 or P48 to identify the next time slot for those iterations of FN2 that involve erasing the information about the next time slot, i.e., those iterations of time slots equal to or later than the time slot stored in P30.)
- P39: Is the time slot located in P38 equal to, earlier than or later than the time slot stored in P30? (Note: To determine this, obtain the year and month for the two dates by locating the DS27 data corresponding to the ID27 that is part (1) of the time slot information and then compare the two years, months and the dates and time slot

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numbers.) Equal to = P30; Earlier than = P43; Later than = P48

- P40: Change the answer to the question about whether the scheduling continues shown on the time slots of this iteration of FN2 to be 'No'.
- P41: Identify and store the information on the time slot in this iteration of FN2 about the next time slot in which the task from P2 is currently scheduled.
- P42: Erase the information on the time slot for this iteration of FN2 about the next time slot in which the task from P2 is currently scheduled.
- P43: Using the DS27 data for this iteration of FN2, compare the preferred time use code (CT11) for the time slot with the actual time use code for the task. Are they the same? Yes = P45; No = P44
- P44: Generate a flag, called the P44 flag. This flag indicates that at least one of the time slots scheduled for the task identified in P2 is scheduled in a time slot that is not the correct preferred time use. (If this flag has already been generated, skip P44.)
- P45: Enter the value entered in P10 onto the appropriate field for the time slot in this iteration of FN2 (onto the time slot on the DS27 data) for the answer to the question about the number of user specified time slots required to complete the task.
- P46: Enter the value stored in P28 onto the appropriate field for the time slot for this iteration of FN2 (i.e., onto the DS27 data time slot) for the answer to the question about the actual time slots scheduled for the task.
- P47: GO TO P50 (next FN2).
- P48: Identify and store the information on the time slot for this iteration of FN2 about the next time slot in which the task from P2 is currently scheduled.
- P49: Erase all of the scheduling information for the time slot for this iteration of FN2 (i.e., for the time slot on the DS27 data); i.e., erase the task identifier (ID23) for the task previously scheduled in this time slot (i.e., the ID23 from P2) and all of the information about the scheduling of the task contained in this time slot.
- P50: NEXT FN2; end of FN2, GO TO P51.

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- P51: Is there a flag in P44? Yes = P52; No = P12
- P52: Enter the answer of 'No' onto the DS24 data from P3 for the question as to whether all of the time slots for the task identified in P2 are scheduled in the preferred time use.
- P53: GO TO P12.
- P54: (From P4): (Note: The user has elected in P5 to erase the weekly schedule identifier (ID28) identifying the weekly schedule data (DS26) that provides the standard restrictions to the scheduling of all tasks involving the participant (i.e., the requirement implementation unit) in the scheduling of the task identified in P2. This means that the user wishes those restrictions to be waived for the task identified in P2 only. If the restrictions shown on the DS26 data identified by the ID28 currently on the DS24 data located in P3 do not apply to the participant any more (i.e., they do not apply for any tasks scheduled for this participant), then the ID28 should be changed on the contact and location data (DS28) for that participant. If the user wishes to add an ID28 (i.e., add standard restrictions) for the participant, this should be done by adding the ID28 to the DS28 data (i.e., to the data on the participant) and not by adding it to the DS24 data (i.e., not by adding it to the data on the task). This would be done in Step F4B-1. Thus, the only change the user can make in Step F4B-6 to the ID28 information on the DS24 data is to erase the ID28 information.) Erase the ID28 from the DS24 data located in P3.
- P55: Identify the answer to the question on the DS24 data from P3 as to whether the restrictions on the scheduling of the task identified in P2 are standard restrictions or are both types of restrictions. (Note: The question could not be answered as 'special restrictions' (i.e., no standard restrictions), as there would have been no ID28 to have erased, if there had been no standard restrictions.) Standard restrictions = P56; Both types of restrictions = P59
- P56: Change the answer on the DS24 data located in P3 for the question as to whether there are any restrictions on the scheduling of the task identified in P2 to be 'No'.
- P57: Erase the answer on the DS24 data located in P3 for the question about the type of restrictions on the scheduling of the task identified in P2.
- P58: GO TO P60.

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- P59: Change the answer on the DS24 data located in P3 for the question about the type of restrictions on the scheduling of the task identified in P2 to be 'special restrictions' (i.e., not 'both types of restrictions').
- P60: Determine from the DS24 data located in P3 whether the task identified in P2 is currently scheduled. Yes = P61; No = P6
- P61: Identify the time slot information on the DS24 data from P3 for the time that this task is scheduled to start.
- P62: Locate the DS27 data corresponding to the monthly schedule identifier (ID27) that is part (1) of the time slot information identified in P61.
- FN3: FOR each time slot in which the task identified in P2 is currently scheduled, beginning with the time slot identified in P61 and the DS27 data from P62:
- P63: Locate the time slot for this iteration of FN3. (Follow the instructions given in P15 of Step F4B-6.)
- P64: Change the answer to the questions on the DS27 data time slot located in P63 about whether there are any restrictions on the scheduling of the task, and, if so, what types of restrictions, to be the current answers on the DS24 data from P3.
- P65: NEXT FN3; end of FN3, GO TO P6.
- P66: (From P4): Ask the user for Q4 (whether the user wishes to add, delete or change special restrictions dates). Add = P73; Delete = P67; Change = P96
- P67: Ask the user for Q5 (number from '1' to '3' identifying which of the three special restriction dates or ranges of dates the user wishes to delete). (Note: There can be up to 3 dates or 3 ranges of dates on the DS24 data showing the special restriction dates for the scheduling of this task.)
- P68: Identify the special restriction date or range of dates on the DS24 data from P3 that the user specified in P67. Erase this special restriction date from the DS24 data located in P3.
- P69: Determine from the DS24 data located in P3 whether there are now any special restriction dates on the DS24 data. Yes = P6; No = P70

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- P70: Identify the answer to the question on the DS24 data from P3 as to whether the restrictions on the scheduling of the task identified in P2 is 'special restrictions' or 'both types of restrictions' (standard and special). Special restrictions = P56; Both = P71
- P71: Change the answer on the DS24 data located in P3 for the question about the type of restrictions on the scheduling of the task identified in P2 to be 'standard restrictions'.
- P72: GO TO P60.
- P73: Determine the number of special restriction dates or ranges of dates that are currently on the DS24 data located in P3, i.e., '0', '1' or '2'. Store this value. (Note: If the answer is '3', tell the user that no more special restriction dates can be added before some of the existing special restriction dates have been deleted.)
- P74: Ask the user for E3 (one of the new special restriction dates or ranges of dates the user wishes to add). Enter this date or range of dates onto the DS24 data located in P3.
- P75: Was the answer in P73 a '0'? Yes = P76; No = P81
- P76: Determine whether the answer on the DS24 data from P3 to the question about whether there are any restrictions on the scheduling of the task identified in P2 is 'Yes' or 'No'. Yes = P77; No = P79
- P77: Change the answer on the DS24 data located in P3 to the question about the type of restrictions on the scheduling of the task identified in P2 to be 'both' (types of restrictions).
- P78: GO TO P81.
- P79: Change the answer on the DS24 data located in P3 for the question as to whether there are any restrictions on the scheduling of the task identified in P2 to be 'Yes'.
- P80: Fill the answer on the DS24 data located in P3 for the question as to the types of restrictions to the scheduling of the task to be 'special restrictions'.
- P81: Determine from the DS24 data located in P3 whether the task identified in P2 is currently scheduled. Yes = P82; No = P6

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- P82: Identify the time slot information on the DS24 data from P3 for the time slot that the task identified in P2 is scheduled to start.
- P83: Identify the time slot information on the DS24 data from P3 for the time slot that the task identified in P2 is scheduled to end.
- P84: Determine what format was used to add (or change) the special restriction dates entered in E3 (as added in P74 or changed in P97). Was the format of the special restriction dates: (1) equal to 'X'; (2) greater than 'X' and less than 'Y'; (3) less than 'X' and greater than 'Y'; (4) less than 'X'; or, (5) greater than 'Y' (where 'X' and 'Y' are dates and 'less than' means before and 'greater than' means after a date)? 1 = P85; 2 = P87; 3 = P90; 4 = P92; 5 = P93
- P85: Is the date that is part (2) of the start time slot information identified in P82 equal to, less than or greater than the date entered as E3? Equal to = P17; Less than = P86; Greater than = P94
- P86: Is the date that is part (2) of the end time slot information identified in P83 equal to, less than or greater than the date entered as E3? Equal to = P17; Less than = P94; Greater than = P17
- P87: Is the date that is part (2) of the start time slot information identified in P82 equal to, less than or greater than the 'X' date for the range of dates entered as E3? Equal to = P17; Less than = P88; Greater than = P89
- P88: Is the date that is part (2) of the end time slot identified in P83 equal to, less than or greater than the 'X' date for the range of dates entered as E3? Equal to = P17; Less than = P94; Greater than = P17
- P89: Is the date that is part (2) of the start time slot identified in P82 equal to, less than or greater than the 'Y' date for the range of dates entered as E3? Equal to = P17; Less than = P17; Greater than = P94
- P90: Is the date that is part (2) of the start time slot identified in P82 equal to, less than or greater than the 'X' date for the range of dates entered as E3? Equal to = P17; Less than = P17; Greater than = P91
- P91: Is the date that is part (2) of the time slot identified in P83 equal to, less than or greater than the 'Y' date of the range of dates entered as E3? Equal to = P17; Less than = P94; Greater than = P17

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- P92: Is the date that is part (2) of the start time slot identified in P82 equal to, less than or greater than the date entered as E3? Equal to = P17; Less than = P17; Greater than = P94
- P93: Is the date that is part (2) of the start time slot identified in P82 equal to, less than or greater than the date entered as E3? Equal to = P17; Less than = P94; Greater than = P17
- P94: Was the answer given in P66 to add special restrictions dates or to change these dates? Add = P95; Change = P96
- P95: Was the answer given in P75 a 'Yes' or a 'No'? Yes = P60; No = P6
- P96: Ask the user for Q5 (number from '1' to '3' indicating which of the 3 special restriction dates the user wishes to change).
- P97: Ask the user for E3 (the new special restriction date or range of dates that the user wishes to indicate is the changed special restriction date).
- P98: Identify the special restriction date on the DS24 data from P3 that the user specified in P96. Erase the current date in that field and replace it with the date entered in P97.
- P99: GO TO P81.

OUTPUTS AND GENERATION OF DATA SETS: None

#### STEP F4B-7

In this Step, the user is allowed to specify the scheduling of a task. The OHMIS scheduling program (Function F4A) automatically schedules tasks as they are identified (i.e., as they are triggered by requirements) according to a particular set of scheduling selection criteria. However, the user may specify the scheduling of a particular task to fit particular needs and this is done in Step F4B-7. This is considered rescheduling, because, in most cases, the task will have already been scheduled in the automatic OHMIS scheduling program. In specifying the scheduling for a task, the user may override most of the scheduling criteria used in the automatic scheduling of the tasks, such as the criteria about interruptions in the normal scheduling of tasks. However, three criteria cannot be overridden: (1) The task must be scheduled to be performed by a person shown as qualified to perform that type of task; (2) the person being scheduled to perform the task must have the time slots the user specifies for scheduling the task shown as available for scheduling; and, (3) only one primary person can be scheduled to perform a task, that is, the time required to perform a task cannot be split among several persons to perform it.

The third criteria above is adhered to because it is deemed as undesirable to allow scheduling for a task that would have one person begin a task and another person finish it. Tasks are always scheduled to have one person perform them from start to finish. If they are not completed, then the remaining time to complete the task (shown by changing the user specified hours required to complete the task to reflect the remaining hours needed) is treated as though it was the entire task, when the uncompleted task is rescheduled. At that time, the task may be scheduled to be completed by a person other than the person who began the task. If, however, the nature of the task is such that it requires more than one person to perform it (as distinguished from the situation in which a task could have been completed by one person, but may not have been finished by the person scheduled to complete it), the OHMIS scheduling program allows the user to specify that additional persons should be scheduled to perform the task at the same time that the task has been scheduled to be performed by the other (primary) person. The specification for additional persons to be scheduled to perform a task is also given in Step F4B-7. The additional person that the user specifies must also be qualified to perform the task and be available for scheduling at the time that the task is already scheduled to be performed by the primary person.

Both the user specified scheduling of a task or the specification by the user that additional persons are to be scheduled to perform an already scheduled task, may result in the need to reschedule tasks. This is because the scheduling specified by the user will be allowed to override the scheduling already set up for the performer of the task, by the OHMIS automatic scheduling program. That is, the user is allowed to specify that a person be scheduled to perform a task at a time in which the person is already scheduled to perform another task. Similarly, if a person is identified to be an additional person to



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perform an already scheduled task, those tasks that this person already has been scheduled to perform that are during the same time period as the tasks that the person is to act as an additional performer for will need to be rescheduled. Step F4B-7 identifies those tasks that need to be rescheduled and makes the necessary changes in the specific task scheduling data (DS24) and monthly schedule data (DS27).

PREVIOUS STEP: None; initiated in the Menu Selection Sequence shown below.

INPUTS (S = Selection; Q = Query (not stored); E = Entry (stored); R = Retrieval):

##### Menu Selection and Input Sequence:

- S1: 7 (scheduling data)
- S2: 4 (specific task scheduling data)
- S3: 4 (rescheduling a task)
- Q1: Task identifier (ID23) for the task for which the user wishes to specify the schedule. Query is in P2.
- Q2: Whether user wishes to specify the scheduling for a task or to specify that an additional person should be scheduled to perform an already scheduled task. Query is in P14.
- Q3: Employee identifier (ID4) of the person the user would like to schedule to perform the task. Query is in P21.
- Q4: Year in which the user would like the task scheduled. Query is in P32.
- Q5: Month in which the user would like the task scheduled. Query is in P33.
- Q6: Day of the month in which the user would like the task scheduled. Query is in P47.
- Q7: Time slot number in which the user would like the task scheduled. Query is in P48.
- Q8: Employee identifier (ID4) of an additional person the user would like to have perform a task. Query is in P159.

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### Data Retrievals:

- R1: A calendar with the number of days in a month for each of the months of a year. This includes the number of days in February for different years (for leap years and non-leap years). This calendar also includes the day of the week (Monday through Sunday) for each day of the year. This calendar is generated once at the initiation of OHMIS and is used thereafter with updates each year.
- R2: Current date
- DS9: Current user/position identity and address data
- DS24: Specific task scheduling data
- DS26: Regular weekly schedule availability data
- DS27: Monthly schedule data (availability and use)
- DL31: List of task identifiers (ID23) for tasks that cannot be scheduled by OHMIS service area (ID10)
- DL34: List of qualified employee identifiers (ID4) by task type (CT8) and by OHMIS service area (ID10)
- DL35: List of requirement implementation identifiers (ID9) for requirements having tasks that need to be scheduled by OHMIS service area (ID10)
- DL39: List of task identifiers (ID23) for tasks that need to be rescheduled by OHMIS service area (ID10)
- DL40: List of weekly schedule identifiers (ID28) by employee identifier (ID4) and by OHMIS service area (ID10)
- DL41: List of the monthly schedule identifiers (ID27) for an OHMIS service area (ID10) with the corresponding year and month covered by the monthly schedule data (DS27) identified by the ID27 and the employee identifier (ID4) of the employee performing the tasks scheduled on this DS27 data

PROCESSING (P = Process substep; FN = For Next (program logic loop)):

- P1: Start a list, called the P1 list. This will be a list of the task identifiers (ID23) of the tasks that need to be rescheduled as a result of the user specifying the schedule for the task identified in P2 (if any tasks need

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to be rescheduled). (Note: If the user specifies a schedule for the task in P2 that overlaps with the existing schedules for another task, these tasks will need to be rescheduled; the ID23 for those tasks is what is put on the P1 list.)

- P2: Ask the user for Q1 (task identifier (ID23) for the task for which the user wishes to specify the schedule or wishes to reschedule or wishes to have an additional performer of the task scheduled).
- P3: Locate the DS24 data for the ID23 entered in P2.
- P4: Identify the OHMIS service area identifier (ID10) on this set of DS24 data.
- P5: Identify the user specified number of time slots required to schedule the task identified in P2. (From the DS24 data located in P3.)
- P6: Determine whether the task identified in P2 is a dated task, i.e., has a due date. (From the DS24 data located in P3.) Yes = P7; No = P8
- P7: Identify the due date for the task identified in P2 using the DS24 data located in P3.
- P8: Determine whether the task identified in P2 is an 'employee transport' task. (From the DS24 data located in P3.) Answers: Yes/No
- P9: Determine the time use code (CT11) for the task identified in P2. (From the DS24 data located in P3.)
- P10: Determine whether there are any restrictions for the scheduling of the task identified in P2 and, if so, what type of restrictions (standard, special or both). If there are standard restrictions, identify the weekly schedule identifier (ID28) that provides the data on these restrictions. Store this ID28. If there are special restriction dates, identify these dates and store them. (From the DS24 data located in P3.)
- P11: Using the DS24 data from P3, identify the standard number of time slots required to schedule the task; whether this task was initiated based on a Reminder Notice type of suspense data or requirements applicability data, and, if based on a requirement, whether it was a mandatory requirement or a recommendation; and, whether this task requires a Scheduling Notice (015).

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- P12: Identify the task type code (CT8) of the task identified in P2. (From the DS24 data located in P3.)
- P13: Determine whether the task specified in P2 has already been scheduled, i.e., has been 'automatically' scheduled by the OHMIS scheduling program (Function F4A). Yes = P14; No = P15
- P14: Ask the user for Q2 (whether this execution of Step F4B-7 is to specify the scheduling for a task or to specify that an additional person should be scheduled to perform an already scheduled task). Schedule (or reschedule) a task = P15; Additional person to perform an already scheduled task = P156
- P15: Start a counter, called the P15 counter, with the value '0'. This will be a counter of the number of time slots tentatively scheduled.
- P16: Start a counter, called the P16 counter, with the value of '0'. This will be a counter of the number of time slots scheduled since the last interruptions.
- P17: Start a counter, called the P17 counter, with the value of '0'. This will be a counter of the number of interruptions.
- P18: Start a counter, called the P18 counter, with the value of '0'. This will be the counter of the number of time slots that are interruptions.
- P19: Skip this step.
- P20: Start a list, called the P20 list. Each entry on the P20 list will have 3 data elements:
- (1) A set of time slot information. This time slot information will consist of three parts: (1) a monthly schedule identifier (ID27); (2) a date of the month (1-31); and, (3) a time slot number (1-96) indicating a quarter of an hour period during the day
  - (2) The value in the P15 counter as of the scheduling of the time slot identified in data element (1)
  - (3) The value in the P17 counter as of the scheduling of the time slot identified in data element (1)
- P21: Ask the user for Q3 (employee identifier (ID4) of the person the user would like to schedule to perform the task). Store this identifier.

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- P22: Using the DL34 list and the ID10 identified in P4, determine whether the employee identified by the identifier entered in P21 is qualified to perform the type of task (CT8) identified in P12. Yes = P27; No = P40
- P23: Tell the user that the person entered is not shown as qualified to perform the type of task specified by the user and that, therefore, it is not possible to schedule this task to be performed by this person.
- P24: Ask the user if the user wishes to reenter the ID4 or quit. Reenter = P21; Quit = P25
- P25: Are there any ID23s on the P1 list? Yes = P26; No = P27
- P26: GO TO P1 of Step F4B-2.
- P27: GO TO P5 of Step F4B-1.
- P28: Start a counter, called the P28 counter, with the value of '0'. This will be the counter of years.
- P29: Start a counter, called the P29 counter, with the value of '0'. This will be the counter of months.
- P30: Start a counter, called the P30 counter, with the value of '0'. This will be the counter of days of the month.
- P31: Start a counter, called the P31 counter, with the value of '0'. This will be the counter of time slot numbers.
- P32: Ask the user for Q4 (year in which the user would like to schedule the task).
- P33: Ask the user for Q5 (month in which the user would like to schedule the task).
- P34: Is the year and month entered in P32 and P33 the same as the value stored in the P28 and P29 counters? Yes = P47; No = P35
- P35: Using the DL41 list, determine whether there is a set of DS27 data (as identified by a monthly schedule identifier (ID27)) for the ID4 entered in P21, the year entered in P32, the month entered in P33 and the OHMIS service area identifier (ID10) identified in P4. Yes = P45; No = P36
- P36: Using the DL40 list determine whether there are any sets of DS26 data (as identified by a weekly schedule identifier (ID28)) for the ID4 entered in P21 and the ID10 from P4. Yes = P39; No = P37

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- P37: Tell the user that it is not possible to schedule a task to be performed by the person specified because there is no existing weekly schedule availability data (DS26) for that person.
- P38: GO TO P24.
- P39: Identify each ID28 entered on the DL40 for the ID4 from P21 and the ID10 from P4. Examine the set of DS26 data corresponding to each such ID28. Is there a set of DS26 data for the ID4 from P21 and the ID10 from P4 that covers the year and month specified in P32 and P33 (i.e., the begin and end dates for the DS26 data include this year and month or include a part of it)? Yes = P42; No = P40
- P40: Tell the user that it is not possible to schedule the task specified to be performed by the person specified, because there is no DS26 data for the year and month specified for the person specified.
- P41: Ask the user whether he/she wishes to quite, specify another employee to perform the task or reenter the time slot information. Quit = P25; Another employee = P21; Reenter = P33
- P42: Generate a flag indicating that it was necessary to go to the Function F4C subroutine from P42 of Step F4B-7 and that the program should return to P45 of Step F4B-7 when Function F4C is completed. Retain this flag throughout the time that the user is logged onto the system or until this flag is erased at the completion of Function F4C.
- P43: Retain the ID10 from P4, the ID4 from P21, the year from P32 and the month from P33. This information will be used in Function F4C.
- P44: GO TO P1 of Step F4C.
- P45: Identify the ID27 on the DL41 list for the ID4 from P21, the ID10 from P4, the year from P32 and the month from P33.
- P46: Locate the DS27 data corresponding to the ID27 identified in P45.
- P47: Ask the user for Q6 (date of the month in which the user wishes to schedule the task). (Note: For editing purposes, it should be realized that this date, in conjunction with the year and month specified in P32 and P33, must be after the current date (R2) for the date to be an acceptable entry.)

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- P48: Ask the user for Q7 (time slot number in which the user wishes to schedule the task).
- P49: Is the value in the P28 counter equal to '0'? Yes = P72;  
No = P52
- P50: Skip this step.
- P51: Skip this step.
- P52: Determine the distance in time slots (number of 15 minute periods) between the date and time currently in the P28 through P31 counters and the date and time entered in P32, P33, P47 and P48. To do this, follow these Processing Substeps (PS):
- PS1: Start a counter, called the PS1 counter, with the value '0'.
- PS2: Derive the value that is equal to the value in P48 minus the value in P31. Add this value to the PS1 counter.
- PS3: Derive the value that is equal to the value in P47 minus the value in P30, multiplied times '96'. Add this value to the PS1 counter.
- PS4: Derive the value equal to the value in P33, minus the value in P29. Is this value equal to '0', less than '0', or greater than '0'? 0 = PS19; Less than 0 = P5; Greater than 0 = FNA (PS8)
- PS5: Derive the value that is equal to the value in PS4, plus '12'.
- PS6: Start a counter, called the PS6 counter, with the value '0'.
- PS7: Start a counter, called the PS7 counter, with the value in the P29 counter.
- FNA: FOR 'X' iterations, where 'X' is the value derived in PS5 or in PS4, if PS5 was never executed:
- PS8: Identify the value (month) in the PS7 counter.
- PS9: Using R1, determine the number of days in the month identified in PS8. Add this value to the PS6 counter.
- PS10: Is the value in the PS7 counter equal to '12'? Yes = PS11; No = PS13

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PS11: Change the value in the PS7 counter to be '1'.

PS12: GO TO PS14 (next FNA).

PS13: Add '1' to the value in the PS7 counter.

PS14: NEXT FNA; end of FNA, GO TO PS15.

PS15: Was the answer in PS4 'less than 0' or 'greater than 0'? Less than 0 = PS16; Greater than 0 = PS18

PS16: Multiply the value in the PS6 counter by '-96'.  
Add this product (negative number) to the PS1 counter.

PS17: GO TO PS19.

PS18: Multiply the value in the PS6 counter by '96'. Add this product (positive number) to the PS1 counter.

PS19: Derive the value that is equal to the value in the P32 counter, minus the value in the P28 counter.  
Is this value equal to '0', less than '0', or greater than '0'? 0 = P53; Less than 0 = P56; Greater than 0 = PS20

PS20: Start a counter with the value in the P28 counter.

FNB: FOR 'X' iterations, where 'X' is the value in PS19:

PS21: Identify the year in the P28 counter.

PS22: Using R1, determine how many days there are in the year for the year identified in PS21.

PS23: Multiply the value in PS22, times '96'. Add this product to the PS1 counter.

PS24: Add '1' to the PS20 counter.

PS25: NEXT FNB; end of FNB, GO TO P53.

P53: Is the value in the PS1 counter equal to '0', less than '0', or greater than '0'? 0 = P54; Less than 0 = P56; Greater than 0 = P58

P54: Tell the user that he/she has given the same time slot for scheduling more than once and this is not acceptable.

P55: GO TO P41.



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- P56: Tell the user that he/she must apply the time slots in which he/she wishes to schedule the task in chronological order and, because this has not been done, this is not an acceptable time slot.
- P57: GO TO P41.
- P58: Is the value in the PS1 counter greater than '1'? Yes = P59; No = P72
- P59: Derive the value that is equal to the value in the P17 counter, plus '1'.
- P60: Tell the user that there will be 'X' interruptions in the scheduling of the task, if the scheduling is done in accordance with the user specifications, where 'X' is the value derived in P59. Ask the user if this is acceptable. Yes = P61; No = P41
- P61: Is the value in the P16 counter less than '3'? Yes = P62; No = P63
- P62: Tell the user that, if the task is scheduled in accordance with his/her specifications, the task will have an interruption after less than three-quarters of an hour's work on the task since the start of the task or since the last interruption. Ask the user if this is acceptable. Yes = P63; No = P41
- P63: Derive the value that is equal to the value in the P15 counter, minus the value in the P17 counter.
- P64: Derive the value that is equal to the value from P5, minus the value derived in P63. Is this value greater than '3'? Yes = P65; No = P66
- P65: Tell the user that, if the task is scheduled in accordance with his/her specifications, the task will have an interruptions with less than three-quarters of an hour's time left to complete the task. Ask the user whether this is acceptable. Yes = P66; No = P41
- P66: Derive the value that is equal to the value in the P18 counter plus the value in the PS1 counter.
- P67: Is the answer given in P8 ('employee transport' task?) a 'Yes' or a 'No'? Yes = P68; No = P72
- P68: Is the value in the PS1 counter greater than '3'? Yes = P69; No = P70

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- P69: Tell the user that, if the task is scheduled in accordance with the user specifications, there will be more than a three-quarters of an hour interruption in the scheduling of an 'employee transport' task. Ask the user if this is acceptable. Yes = P70; No = P41
- P70: Is the value derived in P66 equal to or greater than the value from P5? Yes = P71; No = P72
- P71: Tell the user that, if the task is scheduled as the user has specified, the total length of calendar time to conduct the task will be equal to or greater than the total time to conduct the task and the task is an 'employee transport' task. Ask the user if this is acceptable. Yes = P72; No = P41
- P72: Locate the time slot on the DS27 data located in P46 that is for the date entered in P47 and the time slot number entered in P48.
- P73: Does the DS27 data from P46 indicate that the time slot identified in P49 is available for scheduling? Yes = P76; No = P74
- P74: Tell the user that the time slot specified by the user is not available for scheduling tasks for the person that the user specified to perform the task and, therefore, this task cannot be scheduled in this time slot.
- P75: GO TO P41.
- P76: Was the answer to P6 (dated task?) a 'Yes' or a 'No'? Yes = P77; No = P79
- P77: Is the due date identified in P7 equal to or before the date entered in P32 (year), P33 (month) and P47 (day of the month)? Yes = P78; No = P79
- P78: Tell the user that, if the task is scheduled as specified, it will not be completed before the due date for the task. Ask the user if this is acceptable. Yes = P79; No = P41
- P79: Was the answer to P10 (restrictions?) a 'Yes' or a 'No'? Yes = P80; No = P88
- P80: Does P10 indicate that there are special restriction dates for the task being scheduled? Yes = P81; No = P84
- P81: Is the date entered in P47 one of the special restriction dates (or between one of the ranges of special restriction dates) stored in P10? Yes = P82; No = P83

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- P82: Tell the user that the scheduling of the task as specified would result in scheduling the task on a date restricted for scheduling the task specified. Ask the user whether this scheduling of the task is still acceptable. Yes = P83; No = P41
- P83: Does P10 indicate that there are standard restrictions for the task being scheduled. Yes = P84; No = P88
- P84: Using R1, determine the day of the week for the date identified in P32 (year), P33 (month) and P47 (date of the month).
- P85: Locate the DS26 data corresponding to the ID28 stored in P10.
- P86: Locate the time slot on the DS26 data located in P85 that is for the day of the week identified in P84 and the time slot number entered in P48. Is this time slot restricted? Yes = P87; No = P88
- P87: Tell the user that the scheduling of the task as specified would result in scheduling the task on a date that is restricted for scheduling the task. Ask the user if this is acceptable. Yes = P88; No = P41
- P88: Identify the preferred time use code (CT11) for the time slot identified in P49 on the DS27 data located in P46. Is this CT11 the same as the CT11 identified in P9? Yes = P90; No = P89
- P89: Tell the user that, if the task is scheduled as specified, it will mean that at least one of the time slots will be scheduled for a time for which the preferred time use of the specified performer of the task for that time use is not to do tasks of the type being scheduled. Ask the user if this is acceptable. Yes = P90; No = P41
- P90: Determine whether the time slot identified in P49 on the DS27 data located in P47 is shown as currently scheduled. Yes = P91; No = P95
- P91: Identify the task identifier (ID23) of the task shown as currently scheduled in the time slot identified in P49.
- P92: Is the ID23 identified in P91 the same as the ID23 entered in P2? Yes = P95; No = P93
- P93: Using the DS27 data located in P46 on the time slot located in P49, identify the characteristics of the task currently scheduled in the P49 time slot. These characteristics are: Whether the task is one that is

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scheduled by the user; whether there are any restrictions on the task, and if so, what type (standard, special or both); whether the task is a dated task, i.e., has a due date; whether the task was initiated by a Reminder Notice type of suspense data or a requirement type of applicability data, and, if a requirement type applicability data, whether it was initiated by a mandatory or recommended requirement; whether the task was an 'employee transport' task; and, whether the task requires sending out a Scheduling Notice (015) (i.e., whether the task is such that the participants in the task would have already been notified about the task).

- P94: Tell the user that, if the task being scheduled is scheduled in accordance with the user specifications, it will mean rescheduling a task that is already scheduled in the time slot most recently specified by the user for scheduling. Present the characteristics of the task that will need to be rescheduled to the user (as identified in P93). Ask the user whether his/her specifications for scheduling of the task are still acceptable, even though another task will need to be rescheduled. Yes = P95; No = P41
- P95: Add '1' to the P15 counter.
- P96: Was the value in the P51 counter greater than '1'? Yes = P97; No = P100
- P97: Add '1' to the P17 counter.
- P98: Add the value in the P51 counter to the P18 counter.
- P99: Set the P16 counter to be '0'.
- P100: Add the value in the P51 counter to the P16 counter.
- P101: Erase the value in the P28 through P31 counters.
- P102: Place the value entered in P32, P33, P47 and P48 onto the P28 through P31 counters, respectively.
- P103: Make an entry to the P20 list. Data element (1) should be the ID27 from P45 (part (1)), the date entered in P47 (part (2)) and the time slot number entered in P48 (part (3)). Data element (2) should be the current value in the P15 counter. Data element (3) should be the current value in the P17 counter.
- P104: Derive the value equal to the value in the P15 counter minus the value in the P17 counter. Is this value equal to the value from P5? Yes (i.e., the user has finished scheduling the task) = P105; No = P32

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- P105: Was the answer in P13 (whether the task being scheduled had already been scheduled) a 'Yes' or a 'No'? Yes = P106; No = P124
- P106: Using the DS24 data from P3, identify the time slot information for the start time of the task identified in P2.
- P107: Locate the DS27 data corresponding to the monthly schedule identifier (ID27) that is part (1) of the time slot information located in P106.
- P108: Erase all scheduling information from the DS24 data located in P3, i.e., the information about the scheduling of the task as it was previously scheduled (e.g., start and end time slot information, whether the task was scheduled before the due date, number of interruptions, etc.). Do not erase the information about whether more than one person will perform this task.
- FN1: FOR each time slot in which the task from P2 was previously scheduled, beginning with the time slot identified in P106 and the DS27 data from P107 and continuing with the time slot identified in P111:
- P109: Locate the time slot for this iteration of FN1. (Follow the instructions given in P15 of Step F4B-1.)
- P110: Determine whether the scheduling of the task is to continue to another time slot. (This information is shown on the DS27 data for the time slot located in P109.) Yes = P111; No = P114
- P111: Identify the next time slot in which the scheduling of the task is to continue to. (From the DS27 data for the P109 time slot.)
- P112: Erase all of the scheduling information for the task identified in P2 from the time slot for this iteration of FN1 (as identified in P109), i.e., from the DS27 data.
- P113: NEXT FN1. (End of FN1 will not be reached.)
- P114: Using the DS24 data located in P3 determine whether the task identified in P2 has more than one person scheduled to perform the task. Yes = P115; No = P124
- P115: Identify the up to 3 monthly schedule identifiers (ID27) on the DS24 data located in P3 that specify the monthly schedule data (DS27) on which the scheduling for the task for the additional persons scheduled to perform the task is shown to start. Put the starting ID27s on a temporary list, called the P115 list.

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FN2: FOR each ID27 on the P115 list:

P116: Locate the DS27 data corresponding to the ID27 for this iteration of FN2.

FN2.1: FOR each time slot in which the task identified in P2 is already scheduled and is, therefore, also to be scheduled for an additional person to perform the task at the same time, beginning with the date of the month and the time slot number that are parts (2) and (3) of the start time slot identified in P106 on the DS27 data located in P116 and continuing with the time slot identified in P119:

P117: Locate the time slot for this iteration of FN2.1. (Follow the instructions given in P15 of Step F4B-1.)

P118: Determine whether the scheduling of the task continues to another time slot. (This information is shown on the DS27 data for the time slot for this iteration of FN2.1 as located in P117.) Yes = P119; No = P122 (next FN2)

P119: Identify the next time slot in which the scheduling of this task will continue. (From the DS27 data for the P117 time slot.)

P120: Erase all of the scheduling information for the task identified in P2 from the DS27 data time slot located in P117.

P121: NEXT FN2.1. (End of FN2.1 will not be reached.)

P122: NEXT FN2; end of FN2, GO TO P123.

P123: Change the answer to the question on the DS24 data located in P3 about whether there are additional persons scheduled to perform this task to be 'No'. Erase the information about the additional persons previously scheduled to perform this task shown on the DS24 data.

P124: Begin entering the new scheduling information for the task identified in P2 onto the OHMIS data base. First, complete the DS24 data located in P3. Answer the question about whether the user specified the schedule as 'Yes'. Answer the question about whether the task is scheduled as 'Yes' and remove the code (A-D), if any, explaining why the task could not be scheduled. Enter the value in data element (1) of the first entry on the P20 list as the time slot information for when the task is scheduled to start. Enter the value in data element (1) on the last entry on the P20 list as the time slot for when the task is scheduled to be completed. Enter the value in data element (3) on the last entry on the P20 list as the value

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for the total number of interruptions in the scheduling of the task. Enter the value currently in the P15 counter as the actual number of time slots scheduled.

- P125: Is the ID23 entered in P2 and the ID10 from P4 on the DL31 list? Yes = P126; No = P127
- P126: Remove the ID23 entered in P2 and the ID10 from P4 from the DL31 list. GO TO P132.
- P127: Is the task identifier (ID23) entered in P2 and the OHMIS service area identifier (ID10) from P4 on the DL39 list? Yes = P128; No = P129
- P128: Remove the ID23 entered in P2 and the ID10 from P4 from the DL39 list. GO TO P132.
- P129: Skip this step.
- P130: Skip this step.
- P131: Skip this step.
- P132: Does the task identified in P2 require a Scheduling Notice (015) (as determined in P11)? Yes = P133; No = FN3 (P134)
- P133: Use the DS24 data located in P3 to generate a Scheduling Notice (015) for the task identified in P2.
- FN3: FOR each entry on the P20 list:
- P134: Identify the ID27 contained in part (1) of data element (1) for the P20 list entry in this iteration of FN3.
- P135: Locate the DS27 data corresponding to the ID27 from P134.
- P136: On the DS27 data from P135 locate the time slot equivalent to the day of the month (1-31) and the time slot number (1-96) that are parts (1) and (2) of data element (1) of the P20 list entry for this iteration of FN3.
- P137: Examine the preferred time use code (CT11) for the time slot located in P136. Is this CT11 the same as the CT11 from P9? Yes = P139; No = P138
- P138: Generate a flag, called the P138 flag, indicating that at least one of the time slots in which the task identified in P2 is schedule is not in the correct preferred time use. If this flag has already been generated, skip this step.

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- P139: Is the time slot located in P136 currently shown as scheduled? Yes = P140; No = P144
- P140: Identify the task identifier (ID23) of the task that currently is scheduled in the time slot located in P136.
- P141: Is the ID23 identified in P140 currently on the P1 list? Yes = P143; No = P142
- P142: Add the ID23 identified in P140 to the P1 list.
- P143: Erase all of the scheduling information for the task identified in P140 from the DS27 data time slot located in P136.
- P144: Fill in the empty fields of the time slot located in P136 with the scheduling information about the task identified in P2. To do this, follow these instructions: The task identifier should be the ID23 from P2. The time use code (CT11) for the task should be the time use code from P9. The answer as to whether the scheduling was specified by the user should be 'Yes'. The answer as to whether there are any restrictions on the scheduling of this task and, if so, what type of restrictions they are, should be the information from P10. The user specified number of time slots for the task is from P5. The actual number of time slots scheduled is from the P15 counter. The due date, if any, is from P7. Whether the task is an 'employee transport' task is from P8. The cumulative number of time slots scheduled for the task and the cumulative number of interruptions in the scheduling of the task as of this time slot are from data elements (2) and (3) of the P20 list entry for this iteration of FN3. Whether the scheduling for this task is continued is answered 'Yes', unless this iteration of FN3 is the last P20 list entry, in which case the answer is 'No' (and no continuing time slot information is supplied). The time slot information for the next time slot in which the task scheduled continues is in data element (1) of the P20 list entry that follows the P20 list entry for this iteration of FN3. The rest of the entries onto the DS27 data time slot located in P137 come from P11.
- P145: NEXT FN3; end of FN3, GO TO P146.
- P146: Is there a P138 flag? Yes = P147; No = P148
- P147: Answer the question on the DS24 data from P3 about whether the task is scheduled in the correct time use code (CT11) with the answer 'No'.



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- P148: Was the answer to P6 (dated task?) a 'Yes' or a 'No'? Yes = P149; No = P155
- P149: Identify the ID27 that is part (1) of data element (1) in the last entry on the P20 list.
- P150: Locate the DS27 data corresponding to the ID27 from P149.
- P151: Identify the year and month covered by the DS27 data located in P150.
- P152: Identify the date of the month that is part (1) of data element (1) on the last entry on the P20 list.
- P153: Is the date that is made up of the year and month identified in P151 and the date of the month from P152 equal to or later than the due date for the task given in P7? Yes = P154; No = P155
- P154: Answer the question on the DS24 data from P3 about whether the task was scheduled before the due date with the answer 'No'. GO TO P25.
- P155: Answer the question on the DS24 data from P3 about whether the task was scheduled before the due date with the answer 'Yes'. GO TO P25.
- P156: (From P14): Determine from the DS24 data from P3 whether the number of additional persons currently scheduled to perform this task is '3'. Yes = P157; No = P159
- P157: Tell the user there are currently 3 additional persons already scheduled to perform this task and that no more can be added.
- P158: GO TO P25.
- P159: Ask the user for Q8 (employee identifier (ID4) of the additional person the user would like to have perform this already scheduled task).
- P160: Is the ID4 from P159 currently on the DS24 data from P3 as one of the additional persons scheduled to perform this task? Yes = P161; No = P163
- P161: Tell the user that the person specified is already scheduled to perform the task specified.
- P162: Ask the user whether the user wishes to quit or to reenter the employee identifier. Quit = P25; Reenter = P159

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- P163: Identify the start time slot information for the task identified in P2 as shown on the DS24 data from P3.
- P164: Locate the DS27 data corresponding to the monthly schedule identifier (ID27) that is part (1) of the start time slot identified in P163.
- P165: Identify on the DS27 data from P164 the employee identifier (ID4) that is the person for whom the DS27 data located in P164 is a monthly schedule.
- P166: Is the ID4 identified in P165 the same as the ID4 entered in P159? Yes = P161; No = P167
- P167: Using the DL34 list and the ID10 from P4, determine whether the ID4 entered in P159 is qualified to perform the type of task (CT8) identified in P12. Yes = P170; No = P168
- P168: Tell the user that the person specified is not qualified to perform the task and, therefore, cannot be scheduled to perform the task.
- P169: GO TO P162.
- P170: Generate a list, called the P170 list. This list looks similar to the P20 list. The first 3 data elements are the same as the P20 list format. Data element (4) is another set of 3 part time slot information (i.e., an ID27, a date of the month, and a time slot number).
- P171: Start a marker, called the P171 marker, with the monthly schedule identifier (ID27) that is part (1) of the start time slot identified in P163.
- P172: Start a marker, called the P172 marker, with the date of the month that is part (2) of the P163 time slot.
- P173: Start a marker, called the P173 marker, with the time slot number that is part (3) of the P163 time slot.
- P174: Locate the DS27 data corresponding to the ID27 currently in P171.
- P175: Identify the year and month covered by the DS27 data located in P174.
- P176: Using the DL41 list, determine if there is a set of DS27 data (as identified by a monthly schedule identifier (ID27)) for the ID4 entered in P159, the year and month identified in P175 and the ID10 from P4. Yes = P186; No = P177

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- P177: Using the DL40 list, determine whether there are any sets of DS26 data (as identified by the weekly schedule identifier (ID28)) for the ID4 entered in P159 and the ID10 from P4. Yes = P180; No = P178
- P178: Tell the user that it is not possible to schedule the task specified by the user to be performed by the additional person specified by the user, because the current scheduling of the task is such that this additional person does not have time available for scheduling for at least one of the time slots in which the task is currently scheduled.
- P179: GO TO P162.
- P180: Identify each entry (ID28) on the DL40 for the ID4 from P159 and the ID10 from P4. Examine the set of DS26 data corresponding to each such ID28. Is there a set of DS26 data for the ID4 from P159 and the ID10 from P4 that covers the year and month specified in P175 (i.e., the begin and end dates for the DS26 data includes some part of this year and month)? Yes = P183; No = P181
- P181: Tell the user that it is not possible to schedule the task specified to be performed by the person specified, because there is no DS26 data for the year and month specified for the person specified.
- P182: GO TO P162.
- P183: Generate a flag indicating that it was necessary to go to the Function F4C subroutine from P183 of Step F4B-7 and that the program should return to P186 of Step F4B-7 when the Function F4C subroutine is completed. Retain this flag throughout the time that the user is logged onto the system or until this flag is erased at the completion of Function F4C.
- P184: Retain the ID10 from P4, the ID4 from P159, and the year and month from P175. This information will be used in Function F4C.
- P185: GO TO P1 of Step F4C.
- P186: Locate the DS27 data corresponding to the ID27 currently stored in the P171 marker.
- P187: Locate the time slot on the DS27 data located in P186 that is for the date of the month and the time slot number currently stored in P172 and P173.

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- P188: Identify the number of cumulative time slots scheduled and cumulative number of interruptions in scheduling given in the time slot identified in P187.
- P189: Generate a P170 list entry. Place the value in the P171 through P173 markers are parts (1) through (3) of data element (1) on the new P170 list entry. Place the cumulative number of time slots scheduled and cumulative number of interruptions in scheduling identified in P198 as data elements (2) and (3).
- P190: Does the DS27 data time slot located in P187 indicate that the scheduling of the task identified in P2 continues onto another time slot? Yes = P191; No = FN4 (P197)
- P191: Identify the next time slot on which the task identified in P2 continues. This is shown on the DS27 data time slot located in P187.
- P192: Is the ID27 that is part (1) of the time slot identified in P191 the same as the ID27 currently in the P171 marker? Yes = P193; No = P195
- P193: Place parts (1), (2), and (3) of the time slot identified in P191 onto the P171 through P173 markers, respectively. (Do not add them to the values in the markers, simply replace the existing values with these values.)
- P194: GO TO P186.
- P195: Places parts (1), (2), and (3) of the time slot identified in P191 onto the P171 through P173 markers. (Do not add them, just replace the existing markers with these values.)
- P196: GO TO P174.
- FN4: FOR each entry on the P170 list:
- P197: Locate the DS27 data corresponding to the ID27 in part (1) of data element (1) on the P170 list entry for this iteration of FN4.
- P198: Identify the year and month covered by the DS27 data located in P197.
- P199: Using the DL41 list, identify the ID27 corresponding to the ID4 from P159, the ID10 from P4 and the month and year identified in P198.
- P200: Locate the DS27 data corresponding to the ID27 from P199.

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- P201: Locate the time slot on the DS27 data from P200 with the day of the month and time slot number equal to parts (2) and (3) of data element (1) on the P170 list entry for this iteration of FN4.
- P202: Does the DS27 data time slot located in P201 show that this time slot is available for scheduling, i.e., could be scheduled regardless of whether it is or is not scheduled? Yes = P203; No = P205
- P203: Generate data element (4) of the P170 list entry for this iteration of FN4. Part (1) is the ID27 identified in P199. Parts (2) and (3) are the same as parts (2) and (3) of data element (1) of the P170 list entry for this iteration of FN4.
- P204: NEXT FN4; end of FN4, GO TO FN5 (P207).
- P205: Tell the user that it is not possible to schedule the task specified to be performed by the additional person specified, because at least one of the time slots scheduled for the task is not available for scheduling for that person.
- P206: GO TO P162.
- P207: FOR each entry on the P170 list:
- P207: Locate the DS27 data corresponding to the ID27 that is part (1) of data element (4) (not data element (1)) on the P170 list entry for this iteration of FN5.
- P208: Locate the time slot on the DS27 data located in P207 that is for the day of the month and the time slot number that are in parts (2) and (3) of data element (4) on the P170 list entry for this iteration of FN5.
- P209: Is the time slot located in P208 currently shown as scheduled? Yes = P210; No = P214
- P210: Identify the task identifier (ID23) for the task that is currently scheduled in the time slot located in P208.
- P211: Is the ID23 from P210 already on the P1 list? Yes = P213; No = P212
- P212: Add the ID23 identified in P210 to the P1 list.
- P213: Erase all of the scheduling information for the task identified in P210 from the DS27 data time slot located in P208.

STEP F4B-7

P214: Fill in the empty fields on the time slot located in P208 with the scheduling information about the task identified in P2. This is done in the same way as described in P144, except that the cumulative number of time slots scheduled and the cumulative number of interruptions in this scheduling should be obtained from the values in data elements (2) and (3) on the P170 list entry for this iteration of FN5.

P215: NEXT FN5; end of FN5, GO TO P216.

P216: Using the DS9 data, identify the OHMIS user/position identifier (ID13/ID14) for the employee identifier (ID4) given in P159.

P217: Is the answer on the DS24 data from P3 for whether there are any additional persons scheduled to perform this task a 'Yes' or a 'No'? Yes = P219; No = P218

P218: Change the answer on the DS24 data from P3 about whether there are any additional persons scheduled to perform the task to be a 'Yes'.

P219: Enter the information onto the DS24 data from P3 about the additional persons scheduled to perform the task. Specifically, enter the ID4 from P159, the ID13/ID14 from P216, the ID27 that is part (1) on data element (4) of the first entry on the P170 list, and the ID27 that is part (1) on data element (4) on the last entry on the P170 list.

P220: GO TO P25.

OUTPUTS AND GENERATION OF DATA SETS:

015: Scheduling Notice

## FUNCTION F4C

### Function for Routine Generation of Tentative Monthly Schedule Availability Data

(Functional Data Flow)

In this Function, the program generates a "blank" set of monthly schedule data (DS27) for a particular user (i.e., a particular performer of OHMIS tasks). This "blank" DS27 data shows: (1) the time slots that the user has available for scheduling, and (2) the preferred time use (CT11) for each time slot, i.e., the type of tasks for which the user would like to be scheduled for each time slot. The DS27 data shows these two pieces of information for a particular month of a particular year. The DS27 data is generated from the regular weekly scheduled data (DS26). The DS26 data shows the same two pieces of information for any week in any time period between the begin and end dates specified on the DS26 data.

The purpose behind having these two sets of availability in preferred time use information is that it means that the user need specify his/her regular availability and preferred time use only once (on the DS26 data). The OHMIS program will continue to use this regular availability/preferred time use for any time period for as long as the data is applicable (i.e., for the time between the begin and end dates shown on the DS26 data) to determine the user's availability/preferred time use (for a particular time period) without further action required by the user.

It is in the Function F4C that the OHMIS program takes this regular availability/preferred time use data from the DS26 data set for an individual and uses it to generate a set of DS27 data showing availability/preferred time use data for a particular month of a particular year for that individual. This "blank" DS27 data is then "filled in" (in Function F4A and Step F4B-7) with the scheduling of tasks. In doing this, the program conforms with the availability of preferred time use shown on the DS27 data.

If in a particular month the user wishes to modify his/her schedule (without changing the regular schedule that still continues to apply), this is done by making a modification to the DS27 data for that particular month (in Function F4B). If the user's regular availability/preferred time use schedule actually be changed, this is shown the adding a new set of DS26 data with the new regular schedule and a new date that this schedule is applicable.

Function F4C make be considered to be a subroutine in that it is a processing step used in several functions to prepare the OHMIS data base for those functions. The Function F4C subroutine is executed in three types of circumstances:

## FUNCTION F4C

- 1) Periodically. Once every month, the OHMIS program generates the DS27 data sets for the next two months in advance for all performers of tasks in the OHMIS system who have DS26 data covering any portion of the time in those two months. This process sets up blank monthly schedule data (DS27) to be used routinely by the OHMIS scheduling function (Function F4A and Step F4B-7) to schedule tasks without any further preparation for those tasks scheduled in time slots for up to two months from the present date. This use of Function F4C is initiated in Step F1A-3 when, once a month on the day designated for doing this Function, the program logic "sends" (in a GO TO processing substep) the OHMIS program to the Function F4C subroutine to generate the new DS27 data set. The program "returns" to the Step F1A-3 when this subroutine is completed.
- 2) As needed for scheduling. Even though the program automatically ensures that at least two months of monthly scheduling data are available, it may occur in Function F4A and Step F4B-7 that there is a need for extra months of monthly scheduled data in order to schedule a particular task. In this instance, the scheduling program identifies the particular individual needing extra DS27 data in the year and month for which this data is needed. The program is then "sent" (in a GO TO processing substep) to the Function F4C subroutine. It "returns" to the original scheduling function, when the Function F4C has completed the generation of the "blank" DS27 data needed for the scheduling of the task in that scheduling function.
- 3) Upon the request of the user (Menu Selection 7.3.7). It may occur that the user will wish to generate a blank set of monthly schedule data (DS27) for a particular month. This might be the case, for example, when it is known for several months in advance that the user's scheduling availability will be temporarily altered (i.e., be different from the regular schedule which the user wishes to leave unchanged), such as during a holiday season. The user may wish to generate a blank set of DS27 data so that changes in the availability and preferred time use can be made to this data as soon as the need for these changes is known. This avoids having the OHMIS program Function F4C automatically generating a set of DS27 data and beginning to schedule tasks on that DS27 data with the regular schedule availability/preferred time use data on it.



#### STEP F4C-1

There is only one Step in Function 4C. The purpose of this Step has been described under the description of Function F4C.

PREVIOUS STEP: See R1 below.

INPUTS (S = Selection; Q = Query (not stored); E = Entry (stored); R = Retrieval):

Menu Selection and Input Sequence: (Note: This Menu Selection and Input Sequence is only one of the several ways that the program may reach Step F4C-1; it is the only way in which the user may direct the program to this step.)

- S1: 7 (scheduling data)
- S2: 3 (monthly schedule data)
- S3: 7 (generate a "blank" set of monthly schedule data)
- Q1: Employee identifier (ID4) of the person for whom the monthly schedule data is to be generated. Query is in P35.
- Q2: OHMIS service area identifier (ID10) of the employee identified in Q1. Query is in P36.
- Q3: Year for which the monthly schedule data is to be generated. Query is in P37.
- Q4: Month for which the monthly schedule data is to be generated. Query is in P38.

#### Data Retrievals:

- R1: Flag indicating the point in the OHMIS functional data flows from which the program prescribed the GO TO P1 of Step F4C-1
- R2: Processing substep to which the program is to "return" after completing Step F4C. This information is retained at the time that the R1 flag is generated.
- R3: Information on a particular set of DS27 data that is to be generated. This information includes the employee identifier (ID4), year and month and OHMIS service area identifier (ID10) for the DS27 data that is to be generated. This information is retained at the time that the R1 flag is generated.

(NOTE: The R1, R2, and R3 values are:

STEP F4C-1

R1 = P36 of Step F1A-3; R2 = P37; R3 = not specified, the program determines.

R1 = P444 of Step F4A-3; R2 = P38; R3 = P445

R1 = P446 of Step F4A-3; R2 = P449; R3 = P445.

R1/R2/R3 = processing substeps equivalent to Step F4A-3 in Steps F4A-4, F4A-5, and F4A-7.

R1 = P42 of Step F4B-7; R2 = P45; R3 = P43

R1 = P183 of Step F4B-7; R2 = P186; R3 = P184.

R1 = Menu Selection Sequence 7.3.7; R2 = the appropriate type of Menu '0' (First Level Menu) as determined from the CT1 from R5; R3 = Q1 through Q4.)

R4: OHMIS service area identifier (ID10) from P5 of Step F1A-2

R5: OHMIS user type (CT1) from P2 of Step F1A-2

R6: A calendar with the number of days in a month for each of the months of a year. This includes the number of days in February for different years (for leap years and non-leap years). This calendar also includes the day of the week (Monday through Sunday) for each day of the year. This calendar is generated once at the initiation of OHMIS and used thereafter with updates each year.

R7: Current date

R8: The once a month date on which the new DS27 data is generated. This date is determined once at the initiation of OHMIS.

R9: Next available monthly schedule identifier (ID27)

DS9: Current user/position identity and address data

DS26: Regular weekly schedule availability data

DL34: List of qualified employee identifiers (ID4) by task type (CT8) and by OHMIS service area (ID10)

DL40: List of weekly schedule identifiers (ID28) by employee identifier (ID4) and OHMIS service area (ID10)

STEP F4C-1

DL41: List of the monthly schedule identifiers (ID27) for an OHMIS service area (ID10) with the corresponding year and month covered by the monthly schedule data (DS27) identified by the ID27 and the employee identifier (ID4) of the employee performing the task scheduled on this DS27 data.

PROCESSING (P = Processing Substep; FN = For Next (program logic loop)):

P1: Start a list, called the P1 list. This list will consist of the information about the characteristics of the DS27 data that is to be generated. Each entry on the P1 list will consist of four data elements:

- (1) Employee identifier (ID4) of the employee for whom DS27 data to be generated is a monthly schedule
- (2) OHMIS service area identifier (ID10) for the above employee
- (3) Year of the monthly schedule data (DS27) to be generated
- (4) Month of the monthly schedule data (DS27) to be generated

P2: What is the R1 flag? P36 of Step F1A-3 = P3; Menu Selection Sequence 7.3.7 = P35; all other R1 flags = P52

P3: Identify the year that is part of the R8 date.

P4: Identify the month that is part of the R8 month.

P5: Is the month from P4 a '12'? Yes = P8; No = P6

P6: Generate the value that is equal to the value in P4, plus '1'.

P7: GO TO P10.

P8: Either store the value '1' of the value generated in P6, if P6 was executed.

P9: Derive the value that is equal to the value in P3 plus '1'.

P10: Either store the value that is equal to the value identified in P3 or is equal to the value derived in P9, if P9 was executed.

P11: Start a list, called the P11 list. This will be a list of employee identifiers (ID4).

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FN1: FOR each entry on the DL34 list:

P12: Is the entry for this iteration of FN1 for the OHMIS service area (ID10) from R4? Yes = P13; No = P15 (next FN1)

P13: Identify the employee identifier (ID4) on the entry for this iteration of FN1. Is this ID4 on the P11 list? Yes = P15 (next FN1); No = P14

P14: Put the ID4 identified in P13 on the P11 list.

P15: NEXT FN1; end of FN1, GO TO P16.

P16: Are there any entries on the P11 list? Yes = P18; No = P17

P17: Erase the R1 flag. GO TO (return) to the point given in R2.

P18: Start a list, called the P18 list. This list will be in the same format as the P1 list.

FN2: FOR each entry (employee identifier (ID4)) on the P11 list:

P19: Using the DL41 list, determine if there is an entry (monthly schedule identifier (ID27)) on the DL41 list for the ID4 for this iteration of FN2, the OHMIS service area identifier (ID10) from R4, the year from P3 and the month from P4. Yes = P21; No = P20

P20: Add an entry to the P18 list. Put the ID4 for this iteration of FN2 of the ID10 from R4, the year from P3, and the month from P4 onto the P18 list entry.

P21: Using the DL21 list, determine if there is an entry (ID27) on the DL41 list for the ID4 for this iteration of FN2, the ID10 from R4, the year from P10, and the month from P8. Yes = P23 (next FN2); No = P22

P22: Add an entry to the P18 list. Put the ID4 for this iteration of FN2, the ID10 from R4, the year from P10, and the month from P8 onto the P18 list entry.

P23: NEXT FN2; end of FN2, GO TO P24.

P24: Are there any entries on the P18 list? Yes = FN3 (P25); No = P17

FN3: FOR each entry on the P18 list:

STEP F4C-1

- P25: Identify the employee identifier (ID4) that is data element (1) on the P18 list entry for this iteration of FN3.
- P26: Review the DL40 list and determine if there are any entries (weekly schedule identifiers (ID28)) on the DL40 list for the ID4 identified in P25 and the ID10 from R4. Yes = P27; No = P36 (next FN3)
- P27: Put the entries (ID28s) on the DL40 list for the ID4 from P25 and the ID10 from R4 onto a temporary list, called the P27 list.
- FN3.1: FOR each entry (ID28) on the P27 list:
- P28: Locate the DS26 data corresponding to the ID28 for this iteration of FN3.1.
- P29: Identify the begin and end dates on the set of DS26 data located in P28. (Note: a blank end date indicates that there is no end date for the DS26 data, i.e., that it applies indefinitely; a blank end date should be treated as though the end date were any date later than the begin date.)
- P30: Is the year and month that are elements (3) and (4) on the P18 list entry for this iteration of FN3 covered by the DS26 data from P28, i.e., do the begin and end dates identified in P29 cover the range of time that includes any part of the year/month given in data elements (3) and (4) on the P18 list entry for this iteration of FN3? Yes = P32; No = P31
- P31: NEXT FN3.1; end of FN3.1, GO TO P33.
- P32: Copy the P18 list entries for this iteration of FN1 onto the P1 list.
- P33: NEXT FN3; end of FN3, GO TO P34.
- P34: Are there any entries on the P1 list? Yes = FN5 (P53); No = P17
- P35: (From P2): Ask the user for Q1 (employee identifier (ID4) of the person for whom the user would like to generate DS27 data).
- P36: Ask the user for Q2 (OHMIS service area identifier (ID10) for the person identified in P35).
- P37: Ask the user for Q3 (year for which the user would like DS27 data to be generated).

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- P38: Ask the user for Q4 (month for which the user would like DS27 data to be generated).
- P39: Determine whether there is an entry on the DL41 list for the ID4, ID10, year and month entered in P35 through P38. Yes = P40; No = P42
- P40: Tell the user that there already exists a set of DS27 data with the specifications given by the user.
- P41: Ask the user if the user would like to quit or make another request for DS27 data to be generated. Quit = P34; another request = P35
- P42: Review the DL40 list and determine if there are any entries (weekly schedule identifiers (DL28)) on the DL40 list for the ID4 entered in P35 and the ID10 entered in P36. Yes = P45; No = P43
- P43: Tell the user that it is not possible to generate a new set of DS27 data for the person and time specified by the user, because there is no regular weekly schedule availability data (DS27) for the person specified and time specified.
- P44: GO TO P41
- P45: Put the entries (ID28s) which are the DL40 list and cover the ID10 from P35 and the ID10 from P36 onto a temporary list, called the P45 list.
- FN4: FOR each entry (ID28) on the P45 list:
- P46: Locate the DS26 data corresponding to the ID28 for this iteration of FN4.
- P47: Identify the begin and end dates on the set of DS26 data located in P46.
- P48: Is the year from P37 and the month from P38 covered by the DS26 data located in P46, i.e., do the begin and end dates identified in P47 cover the range of time that includes any part of the year/month identified in P37 and P38? Yes = P50; No = P49
- P49: NEXT FN4; end of FN4, GO TO P17.
- P50: Generate an entry onto the P1 list. This entry consists of the values entered in P35 through P38.
- P51: GO TO FN5 (P53).

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P52: (From P2): Put the 4 values from R3 onto the P1 list.

FN5: FOR each entry on the P1 list:

P53: Review the DL40 list and identify all entries (week schedule identifiers (ID28s)) for the ID4 and the ID10 that are data elements (1) and (2) of the P1 list entry for this iteration of FN5. Put the DL40 list entry (ID28) on a temporary list, called the P53 list.

P54: Generate a list, called the P54 list. Each entry on this list will consist of 3 data elements:

- (1) A regular weekly scheduled identifier (ID28)
- (2) The begin date from the DS26 data corresponding to the ID28 from data element (1)
- (3) The end date for the ID28 from data element (1)

FN5.1: FOR each entry (ID28) on the P53 list:

P55: Locate the DS26 data corresponding to the ID28 for this iteration of FN5.1.

P56: Identify the begin and end dates of the DS26 data from P55. Do these begin and end dates cover any part of the year and month shown in data elements (3) and (4) of the P1 list entry for this iteration of FN5? Yes = P57; No = P58 (next FN5.1)

P57: Generate an entry for the P54 list. Put the ID28 for this iteration of FN5.1 as data element (1) and the begin and end dates identified in P56 as data elements (2) and (3).

P58: NEXT FN5.1; end of FN5.1, GO TO P59.

P59: Begin to generate a set of DS27 data. Assign the ID27 from R9; the ID10 from data element (2) of the P1 list entry for this iteration of FN5; the year and month from data elements (3) and (4) of the P1 list entry for this iteration of FN5; and, the employee identifier (ID4) from data element (1) of the P1 list entry for this iteration of FN5. Obtain the OHMIS user/position identifier (ID13/ID14) for the ID4 that is in data element (1) of the P1 list entry for this iteration of FN5 from the DS9 data set corresponding to this ID4. The format of the DS27 data set should be to have 96 time slots (one for each quarter of an hour period) for each of the 31 days of a month. Assign the numbers (1-31) to each of the days of the month and the time slot numbers (1-96) to each of the time slots for each of the 31 days of a month. Using the

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R6 data, determine how many days of the month there are for the month (and year, if necessary) given in data element (4) (and data element (3)) of the P1 list entry for this iteration of FN5. If there are less than 31 days in the month, fill in the additional days as follows: (1) Answer the question on the newly generated DS27 data for the day about whether there is any part of the entire day that is available for scheduling as 'No'; (2) Answer the question for each of the 96 time slots under each of these additional days about whether the time slot is available for scheduling with the answer 'No'. Also using the R6 list, fill in the day of the week (1-7) for each of the days included in the month.

FN5.2: FOR each of the days of the month (1-31) on the DS27 data generated in P59:

P60: Is the entire day shown on the DS27 data as not available for scheduling (i.e., is this day not really one of the days of this month)? Yes = P79 (next FN5); No = P61

P61: Is there an entry on the P54 list with a begin and end date that covers the year and month shown in data element (3) and (4) of the P1 list entry for this iteration of FN5 and the date of the month for this iteration of FN5.1? Yes = P64; No = P62

P62: Fill in the answer on the DS27 data generated in P59 for the day of the month for this iteration of FN2 for the question about whether there is any scheduling time available for the entire day, with the answer 'No'. Also fill in the question about whether the time slot is available for scheduling on each of the 96 time slots for the day of the month for this iteration of FN5.2 with the answer 'No'.

P63: GO TO P78 (next FN5.2).

P64: Identify the P54 list entry with the begin and end dates covering this iteration of FN5.2, i.e., this year, month and day of the month.

P65: Locate the DS26 data corresponding to the ID28 in data element (1) on the P54 list entry located in P64.

P66: Identify the day of the week that corresponds to the day of the month for this iteration of FN5.2. (This is shown on the DS27 data for this day.)

P67: Locate the day of the week identified in P66 on the DS26 data located in P65.



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P68: Is the answer on the DS26 data located in P65 for the day of the week located in P67 about whether there are any time slots on this entire day available for scheduling a 'Yes' or a 'No'? Yes = FN5.2.1 (P69); No = P62

FN5.2.1: FOR each time slot (1-96) on the DS27 data generated in P59 for the day of the month for this iteration of FN5.2:

P69: Locate the time slot for this iteration of FN5.2.1 on the DS27 data from P59 for the day of the week in this iteration of FN5.2.

P70: Locate the time slot for this iteration of FN5.2.1 on the DS26 data from P65 for the day of the week located in P67.

P71: Does the DS26 data time slot located in P70 show the time slot for this iteration of FN5.2.1 to be available for scheduling? Yes = P74; No = P72

P72: Enter a 'No' on the DS27 data time slot located in P69 for the question as to whether this time slot is available for scheduling.

P73: GO TO P77 (next FN5.2.1).

P74: Enter a 'Yes' on the DS27 data time slot located in P69 for the question as to whether this time slot is available for scheduling.

P75: Identify the preferred time use code (CT11) on the DS26 data time slot located in P70.

P76: Enter the CT11 identified in P75 onto the appropriate field of the DS27 data time slot located in P69.

P77: NEXT FN5.2.1; end of FN5.2.1, GO TO P78.

P78: NEXT FN5.2; end of FN5.2, GO TO P79.

P79: NEXT FN5; end of FN5, GO TO P17.

OUTPUTS AND GENERATION OF DATA SETS:

DS27: Monthly schedule data (availability and use)

SECTION VII - RECOMMENDED SYSTEM DESIGN - PART 3  
System Specifications and Features

## VII. RECOMMENDED SYSTEM DESIGN - PART 3

### System Specifications and Features

#### 7.1 GENERAL FEATURES

OHMIS is essentially a DBMS operated in concert with VIABLE with requisite interfaces with the supply, military and civilian personnel and facility disk-to-disk data outputs of VIABLE. To facilitate deployment, OHMIS is a modular system designed around the individual needs and capabilities of the three primary types of users: the Occupational Health organization, the Industrial Hygiene organization and the "System Administrator" (USAEHA) (FIGURE 1).

While specific design details are not yet possible as VIABLE technical data is still closely held, OHMIS will be primarily an on-line system. That is, the processing will be done on a transaction basis from each installation using the hardware associated with the five VIABLE regional centers. This process can be used for all commands except DARCOM, which is not scheduled to receive VIABLE. DARCOM installations will use a communications modem to access the nearest VIABLE regional center. Transactions will be entered from the user's terminal, edited for accuracy and then used to update the data base and generate requested responses. Where they exist, the Occupational Health and Industrial Hygiene units of each installation and major commands may:

- o add data
- o change some existing data
- o delete data
- o examine data

These actions are subject to the control procedures established by the "System Administrator." The control procedures limit each type of user's access to only those selected data elements applicable to the user.

OHMIS is designed to minimize user training requirements through use of formatted menus. When the user selects the type of action desired, a formatted screen containing output data or outlining the appropriate input data elements is displayed. When the user is updating the data base, all information keyed in and transmitted is edited by highlighting errors on the screen so that the user is afforded the opportunity to correct the error(s). After any errors have been corrected, the data is then presented to the user for final review. After this review, the user may transmit the data. At this point, the data base is updated and the transaction completed.

Disk-to disk-updating capabilities will be provided within VIABLE to interface OHMIS with supply, personnel and facility data systems.

## 7.2 SPECIFIC PERFORMANCE REQUIREMENTS

OHMIS shall be designed so as to provide for:

1. Modular installation, increasing both in the number of application modules supported and in the number of locations served.
2. Use by non-ADP personnel, primarily by CRT input/output, with local hard copy output as an option for each user.
3. Immediate verification of data input.
4. Generation of standard periodic reports, upon request or at the end of fixed time intervals, which accurately represent the contents of the data base.
5. Inquiry and report writer functions by which non-ADP personnel can generate special reports.
6. Security factors to protect information covered by privacy or classified data considerations, and to protect the integrity of the data base.
7. OHMIS system monitoring, to give information on system usage, problems and effectiveness, and to report attempted improper use.
8. Application program development tools to facilitate system maintenance and enhancements.
9. Backup and restart capabilities.
10. Sufficient flexibility to allow creation or deletion of fields and records without major reorganization of the data base system, and to provide for rapid buildup of the data base during the OHMIS growth phase.

### 7.2.1 Accuracy and Validity

System hardware and software shall detect and trap errors. Data files shall be updated on-line at the time of entry. Since multiple users may access the same file, provision must be made for file locking and unlocking.

Editing Checks: The following are the major features of the editing specifications that should be included in the OHMIS design:

1. Input data will be checked for form (e.g., alphabetic, numeric, date, Social Security number) and validated for range against system constants and tables before being selected.
2. In some modules, selected data elements will require validation against existing files.

3. Input data that fails the checking procedure will be immediately identified to the user for correction (exception notification).
4. Input data will be entered through formatted screens. After the editing and validation process, users will be provided the capability to "review" entries prior to final transmission of input. Review capability should include ability to select a given line on the screen for modification and preferably a single-line editing mode for simplicity in correcting an error on a line.
5. Opportunity shall be provided for return to menu without transmission of input.
6. Batch processing editing shall provide for errors (exceptions) being identified on an output listing.

Missing Data: Specified data elements may have the value of "unknown." These must be distinguished from "zero" value.

#### 7.2.2 Response Times

OHMIS data processing is only moderately time-sensitive in that degradation of timing will result primarily in wasted personnel time rather than in complete failure to meet significant mission requirements.

Input Data Management: The time interval between the completion of transmission of a screen of data and the readiness of the next screen of data input should not exceed five seconds. Design of the data input checking methods should provide for as rapid a response as feasible.

On-Line Requirements: Occasional off-line periods of as long as one hour could be tolerated. Ninety-eight percent on-line performance would satisfy OHMIS requirements for efficient personnel use.

Standard Report Generation: Standard (periodic) reports should be generated with a turnaround time from initiation of request (or automatic initiation, e.g., at the end of a time period) of 24 hours.

Special Report Generation: On-line generation of reports is required for specified OHMIS functions and should be accomplished with a turnaround time not to exceed 30 minutes.

#### 7.2.3 Storage Requirements

Due to undeveloped coding schemes used to classify much of OHMIS' data, it is not possible to exactly assess the on-line storage requirements of OHMIS at this time. However, using estimated field lengths for undefined data elements and approximation of the number of occurrences expected, the estimated on-line storage requirements for full scale OHMIS operation is 761 million bytes system-wide.

#### 7.2.4 Expected Growth

The expected growth for OHMIS is a factor of five (5) as the system will maintain five years of data on-line for analysis. Accordingly, five years from the system start-up, the on-line storage requirement will be 3.8 billion bytes. Archive requirements will grow at a rate of 761 million bytes per year for a maximum of 25 years or 19 billion bytes of archive off-line storage requirements.

### 7.3 FAILURE CONTINGENCIES

#### 7.3.1 Failure Modes

Failure conditions that must be considered include failure of major hardware or an operating system, telecommunications failure, and failure of an application program (whether arising from system error or a program "bug").

Hardware/Operating System Failure: As discussed in Section 7.4, a major network rather than a stand-alone hardware environment is envisioned for OHMIS. Accordingly, it may be assumed that failure of major hardware or an operating system will be handled by the appropriate network managers and that status messages will appear on local terminals.

Applications Program Failure: Programs must be designed for use by nontechnical terminal operators and must have error trapping that allows the user to continue or return to a menu. As indicated under "restart" in Section 3.5.4, the user must be able to determine unambiguously, in the event of a failure during transaction processing, which data items have been accepted and which have not.

Telecommunications Failure: It may be assumed that failure of the telecommunications functions of the network will be handled by network managers. Failures should result in an unambiguous indication to the terminal operator that the system is not operative. Some modules of the OHMIS system may require input of industrial hygiene data in the field through the use of portable printing terminals and local dial-up lines. These lines may introduce considerable noise into echo-back or printout and provision must be made in programming for an option to provide a confirmatory printout of data that has been input.

#### 7.3.2 Backup Requirements

OHMIS should provide the capability to backup to tape all on-line files used to support functional modules. Backup shall be routine and periodic, or on demand. Backup tapes shall include as data on the tape itself positive identification information regarding date, time and files copied. OHMIS shall also provide the capability to restore on-line files from backup tapes.

OHMIS shall also provide the capability to archive to machine-readable media all records, removed from the on-line files at the time of each purge run. The date, time and files copied must be included in the data on the media.

To cope with failure resulting in data loss between backups, OHMIS must provide either a hard copy "audit trail" to each user or a file maintenance log tape that can be used to regenerate entries. It must be possible for users to know unambiguously which transactions have been recorded by OHMIS.

Restart Requirements: OHMIS must provide the capability for cold start. Restart and recovery arising from system failure may be assumed to be controlled by the network managers. OHMIS must provide that the transactions processed prior to or during system failure and restart are either correctly processed with appropriate file updates or rejected, and the user must know unambiguously at which point in the transaction sequence current processing stopped. The user must be able to restart transaction processing at this point or at the preceding menu.

Fallback Requirements: The physical location of OHMIS on-line files within the network (see Section 7.4) should be such as to allow continued local processing of as many modules as possible in the event of telecommunications failure between local Army posts and regional data centers. Such failure would preclude access to interfaced data systems.

#### 7.4 ENVIRONMENT

##### 7.4.1 Equipment Environment

OHMIS comprises a network of facility-level user processing data for local use, in addition to one or more central offices plus interfaces to numerous other systems. The central offices will require two-way on-line data communication with the local users. Incremental growth is planned, both in the number of local users and in the program set used by each. The equipment requirements can by met be a large U. S. Army-wide data processing network such as VIABLE, incorporating distributed data processing systems linked to regional data centers through telecommunications.

Local data processing centers must have at least the following capabilities (either provided locally or via the network):

- a. Processor. The CPU must have sufficient allocable memory (minimum 256K) to efficiently run any data base management system used.
- b. Storage Media. Direct-access requirements at each locality will be a function of the number of employees and facilities served by that locality, typically 500 million characters.
- c. Output Devices. Each locality will require as a minimum a high-speed printer and a tape drive. Multiple CRT terminals with graphics and editing capabilities will be required as input-output devices, with nearby low-speed printers

(typically 120 characters/sec) with graphics and form-handling capability. Portable printing terminals will also be required for field input/output of data via local phone lines. Typically, each locality will require three dedicated CRT/printer units and two portable printing terminals. The remaining element can be shared.

- d. Input Devices. Each locality will require as a minimum a tape drive and a card reader. During the initial data load-up phase, OCR equipment would be desirable.
- e. Communications. Within each locality, communications facilities must allow each CRT terminal to operate at a minimum of 9600 bps, and each printer to operate at its rated speed.

The central office will require a dedicated tape drive and RJE equipment, a high-speed printer, multiple CRT terminals with editing and graphics capability, and multiple letter-quality printers. At least one CRT terminal must be equipped to utilize the program development utilities of the overall system. Access to a shared card reader, card punch, additional high-speed printers, OCR equipment and tape drives will also be required.

#### 7.4.2 Support Software Environment

The operating system must have multitasking, multithread capabilities to perform the following functions:

- o program testing and development;
- o interactive transaction processing;
- o batch and on-line file input, inquiry, and update;
- o monitoring for OHMIS system;
- o access to non-OHMIS files;
- o multilevel security for access and update;
- o restart and recovery without uncontrolled loss of transaction data and without file damage;
- o electronic mail;
- o downloading of program updates from central office to localities;
- o data base management with relational capabilities.

The operating system must support all currently valid high-level languages, including as a minimum Army Standard COBOL and ANSI FORTRAN 77.



#### 7.4.3 Interfaces

The following systems have been identified as interface requirements for OHMIS, with the indicated access requirements (on-line or batch):

- a. SAILS
- b. SIDPERS
- c. SCIPMIS
- d. JUMPS
- e. STARCIPS
- f. IFS

Batch data transfer may be via tape or telecommunications. OHMIS does not directly update any files in these data systems. Any data errors or discrepancies noted will be transmitted to the appropriate system manager by electronic mail.

#### 7.4.4 Security and Privacy

OHMIS contains patient-sensitive data which is subject to the provisions of the Privacy Act of 1974, resident in the system either by input from an OHMIS module or by transfer via an interface from another system. System security must be designed to limit and control access to the entire OHMIS system, limit specified functions to authorized users, and meet requirements of interfaced systems from which data is transferred. (Some data elements, e.g., supply data, special chemicals, may involve classified data.) System security should be table-driven.

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